ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS

OCTOBER

1937

★ Few and far between are the farms within reach of power lines here in the Far West which have not received electric service. Rural electrification, fostered and promoted by the initiative of the power utilities, has and will continue to play an important role in the agricultural development of this region. In this issue is a review of rural line development, a summary of present programs and detailed examples of the new standards of construction developed to serve farm load. These studies reveal how an orderly program based on sound economics and engineering work for the ultimate benefit of both the utilities and farm customer.

McGraw-Hill Co. of Calif. Price 25c per Copy

Edison

Advertising Bulletin

ADVANCE SCHEDULES AND INFORMATION FOR ELECTRICAL DEALERS IN EDISON TERRITORY

Issued by Advertising Department, Southern California Edison Company Ltd.

Range Promotion Scheduled For August

Red Tag Event Starts August Fifth

EVERY THURSDAY throughout the month of August, a big, compelling ad will drive home the advantages of electric cooking with copy appeals that have particular application right now. These ads will put over a commanding story in headline, illustration and text. Their distinctive shape will command attention in any position.

To be *completely* effective this advertising needs one more thing and that's where you can help. Our messages concentrate on selling the idea of electric cookery; it's up to you to tell the newspaper readers *where to buy*.

That means tie-in ads run on the same page with ours featuring your merchandise, your location and your service facilities. That's the way to make this Edison advertising really work for you. Call your paper now and arrange for your tie-in space.

Red Tag Electric Range Event Promotion Schedules

Thursday, Aug. 5
Thursday, Aug. 12
Thursday, Aug. 19
Thursday, Aug. 26

Order Your Tie-in Ads Now

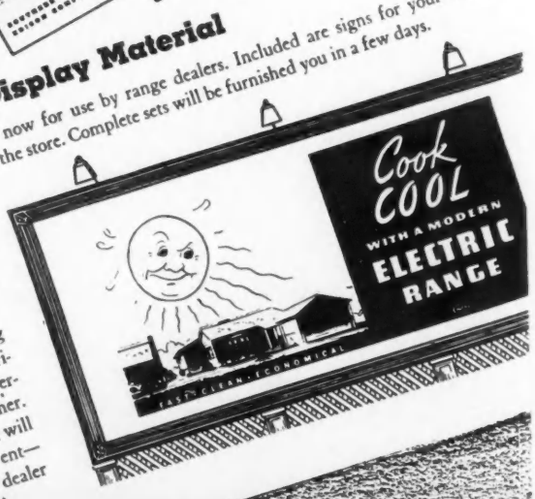
Every Home can afford a modern ELECTRIC RANGE
cook in cool comfort with an ELECTRIC RANGE
Do it now
2 or $3
Easy Terms
You can buy an ELECTRIC RANGE as low as $2 or $3 a month
LOW DOWN PAYMENT

Sell Ranges Now

Right through the summer months Edison advertising has continued to feature electric ranges. Now is the time to cash in on the effect of this advertising by demonstrating the advantages of electric cookery to every possible prospect. Each season the electric range becomes easier to sell.

Free Display Material

terial is being completed now for use by range dealers. Included are signs for your window ags to go on the ranges in the store. Complete sets will be furnished you in a few days.



llboards nges, Too

POSTER will be up during billboards in Edison terri- sizes cool cookery, a power- housewives in hot weather. dvertising during August will of the big Red Tag event— radio and dealer

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), October, 1937, Vol. 79. No. 4. Published monthly by the McGraw-Hill Company of California, 883 Mission St., San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shilling). Single copy, 25c.
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ELECTRICAL WEST

WITH WHICH ARE CONSOLIDATED THE "ELECTRICAL JOURNAL," THE "JOURNAL OF ELECTRICITY, POWER & GAS," AND THE "JOURNAL OF ELECTRICITY"

ESTABLISHED 1887

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Figures often lie. But when several unrelated agencies produce figures which substantially agree, then you can trust them. That's the case with those derived from recent surveys and estimates of rural electrification in the West. You can trust them—and be proud of them. Because they not only show tremendous past growth but also indicate a very large future growth. Regions which because of their sparse population have never known the conveniences of electricity are being opened up through the use by both utilities and REA of new, more economical methods of line construction. Everywhere farmers are working for, counting on the day when they will be served. And always the electrical industry—the whole industry—is meeting the demands.

It was because of the very timeliness of the subject that Electrical West this month presents all the latest developments in rural line construction methods. They are discussed beginning page 53.

Of equal interest to the industry is the ever-growing movement toward adequate wiring, better lighting. Contractors at the N.E.C.A. convention in Los Angeles, Oct. 18-21, will discuss these problems from A to Z. An introduction to the meeting is made by this issue in "Confession of an Electrical Contractor," page 29; "Where Cooperation Works," page 32; "Somebody Tripped," page 35, and in the host of short items under "Lighting and Wiring Trends," page 63.

SERVICE IS SECURE WITH DELTABESTON

Purified Asbestos Insulation Solves Maintenance Problems

DESIGNED AND BUILT FOR LASTING PERFORMANCE

INSULATED WITH PURIFIED ASBESTOS

★ 1. Quality Materials
★ 2. Constant Research
★ 3. Modern Manufacturing
★ 4. Experienced Workmen
★ 5. Exacting Tests

Talk to maintenance engineers who specify Deltabeston Wire and Cable. From their experience, learn the outstanding advantages of Purified Asbestos Insulation. Many of these men have used Deltabeston for years . . . and they are more enthusiastic about its reliability every day. They know that Deltabeston Conductors serve electrical equipment faithfully and well.

IN YOUR PLANT

There are locations in your plant too severe for wire and cable with ordinary insulation. Intense heat . . . moisture . . . oils and greases may be prevalent. Frequent overloads subject circuits to added strain. In those cases, you need Deltabeston. Purified Asbestos assures you of improved insulation and dielectric strength . . . added life and uninterrupted service.

A COMPLETE LINE

The choice of wire and cable for your circuits must be right . . . the first time. A complete line of Deltabeston conductors enables you to be certain . . . every time. Switchboard Wire, Control Cable, Boiler Room Wire, Power Cable . . . there is a type for every requirement.

Write for information. Address Section Y-9210 Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

Deltabeston Wire and Cable is distributed by General Electric Merchandise Distributors and Graybar Electric Company.

GENERAL ELECTRIC

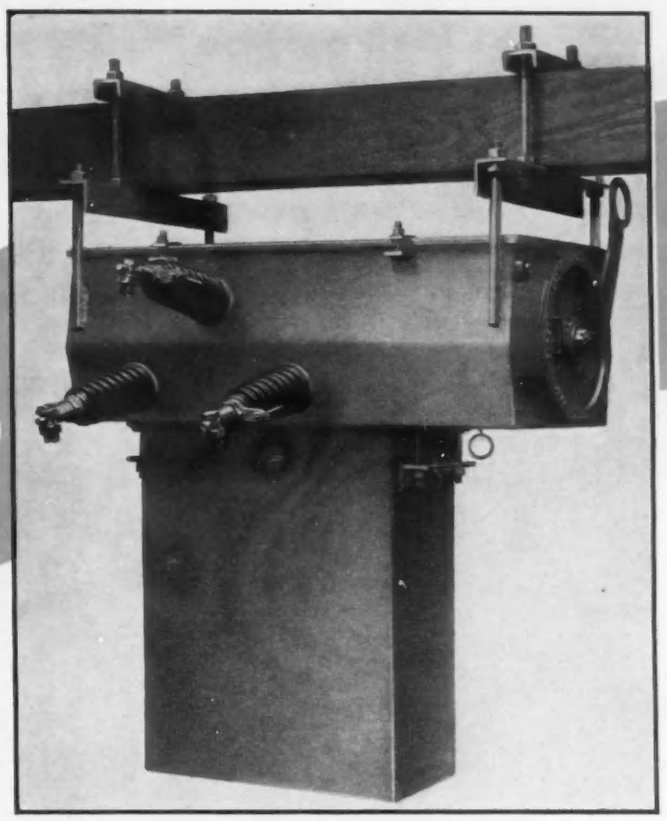
DELTABESTON WIRE AND CABLE

APPLIANCE AND MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

PROVEN

to be

Reliable



under

all Kinds of Weather Conditions

Utilities in all parts of the United States have proven that Pacific Electric Automatic Service Restorers provide dependable overload protection. All operating parts are completely enclosed, being designed to function perfectly regardless of weather conditions.

WHY THEY ARE DEPENDABLE!

Completely enclosed operating parts assure reliable protection even under extreme weather conditions.

Greater overload protection provided by simultaneous opening of all poles.

Three automatic reclosures are adjustable for either time delay or for immediate reclosing.

Positive tripping at low currents —trips on ten amperes.

Now, Pacific Electric answers a popular demand by offering a high voltage automatic service restorer, Type AP-2, that is rated at 15,000 volts, 100 amperes. Like the Type AP-1, rated at 7500/12,500 volts, it clears shorts effectively—then quickly and automatically restores service without the use of any auxiliary power.

The outstanding performance and economy of these restorers make them particularly applicable to rural lines—especially as they are priced to fit rural line budgets! Let us send you full details.

Write Today for Bulletin No. 47

Pacific Electric Mfg. Corp.

5815 3rd St., San Francisco, California. **Dunes Highway, Gary, Indiana**

TESTS PROVE CALROD HAS

THE FASTEST DURABLE ELECTRIC RANGE UNIT IN THE WORLD

Not only has Calrod demonstrated itself to have 6 times the life of the other electric cooking units in these tests, but it has consistently shown greater speed—*from* 11% *to* 21% *faster than any other unit.* Such performance places Calrod irrefutably at the top of all heating units—establishes Calrod as the single electric unit which has made electric cookery both fast and economical.

These tests can be duplicated in your own laboratory with standard equipment.

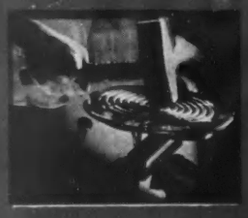
Vast Saving in Service Cost

Translate Calrod's amazing speed and outstanding durability into terms of your own business. Calrod insures efficient performance, satisfied customers and a negligible service cost. Nearly half of all electric ranges now being sold are equipped with Hi-Speed Calrod. Follow the lead of those who know performance. Let Calrod's winged speed and persistent life point the way to richer profits, undiluted by service expense.

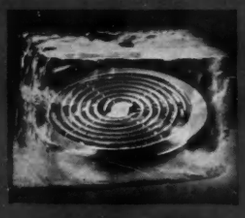
***The Popular Priced* NEW DORCHEST**

Hotpoint's specially designed model for Fall a Christmas selling. All porcelain enamel or por lain with Calgloss body. Trimmed in chromi Includes new semi-direct lighting lamp with brac and condiment shelf; new Time Chime. Th Hi-Speed Calrod units and 6-qt. Thrift Cook

FURTHER LIFE TESTS IN OUR OWN LABORATORIES

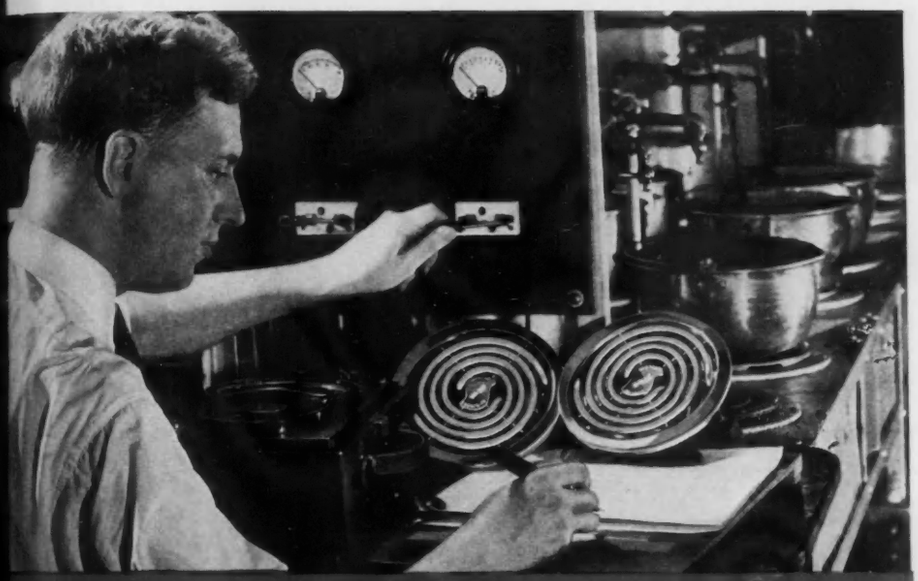


Pounded, pulled, twisted and bent in every conceivable way Calrod quickly glowed with heat when connected up to electric current.



Frozen solid, then connected up, Calrod—immune to the effects of moisture and temperature extremes—melts itself out of ice.

SIX TIMES LONGER LIFE
Than Other Electric Range Units



ELECTRICAL TESTING LABORATORIES REVEAL ASTONISHING FACTS ABOUT ELECTRIC UNITS IN SERIES OF EXHAUSTIVE TESTS FOR DURABILITY

The engineers of Electrical Testing Laboratories, an independent testing organization, conducted a series of life tests on electric cooking units for Hotpoint. These tests resulted in Calrod showing an average life in excess of 4,565 hours,* the second best unit lasted an average of 702 hours, and the third best failed after an average of 264 hours.

Calrod as well as units of other manufacture used in these tests were selected from stock by Electrical Testing Laboratories representatives or purchased in the open market. All 1200 watt units were operated at rated wattage plus 5% to allow for current variations. All units were operated 60 minutes on high heat 20 minutes off.

Tests Prove Calrod's Amazing Record

The results were highly gratifying to Calrod engineers. The findings of Electrical Testing Laboratories substantiate Hotpoint's claims for durability of Calrod units. After many laboratory tests and years of field service, Hotpoint engineers were convinced that Calrod was the fastest durable electric range unit ever built; that it would operate at full rated wattage for life; that it cut service expense and made electric cookery fast and economical. Calrod dealers and customers found that Calrod outperformed all other electric range units.

In order to place our claims for Calrod's long life at full rated wattage beyond doubt or criticism, the Electrical Testing Laboratories conducted independent life tests at Hotpoint's request. The Electrical Testing Laboratories engineers established their own testing method.

Get further details about these Calrod tests. Send coupon today.

RESULTS OF TESTS

The results shown in the following table are from the records of Electrical Testing Laboratories. Confirmation, and full details of the tests, may be obtained by writing Electrical Testing Laboratories, New York City.

New 1200-Watt Units Operated at Nameplate Wattage Plus 5% or 1260 Watts

AVERAGE LIFE ON HIGH HEAT

UNIT	LAB. LIFE TEST
Calrod	4,565 hours *
X-1	264 "
X-2	702 "

On the basis of these tests Calrod lasted 6 times longer than the next best unit.

*No Calrod units had failed when these tests were ended.

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
5612 W. Taylor Street, Chicago, Illinois

Edison General Electric Appliance Co., Inc.
5612 W. Taylor St., Chicago, Ill.

Please send me more information about Calrod's speed and long life.

Name_____

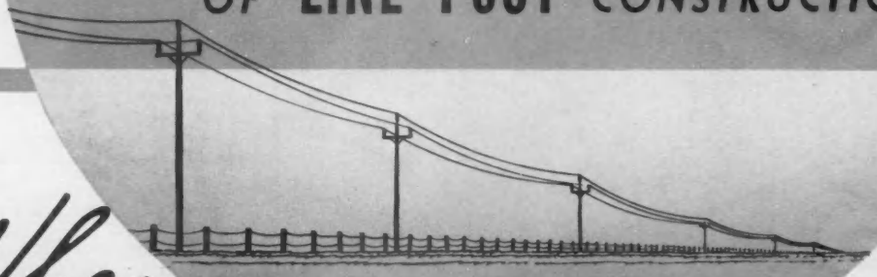
Address_____

City_____ State_____

ELECTRIC Hotpoint RANGES
WITH HI-SPEED CALROD

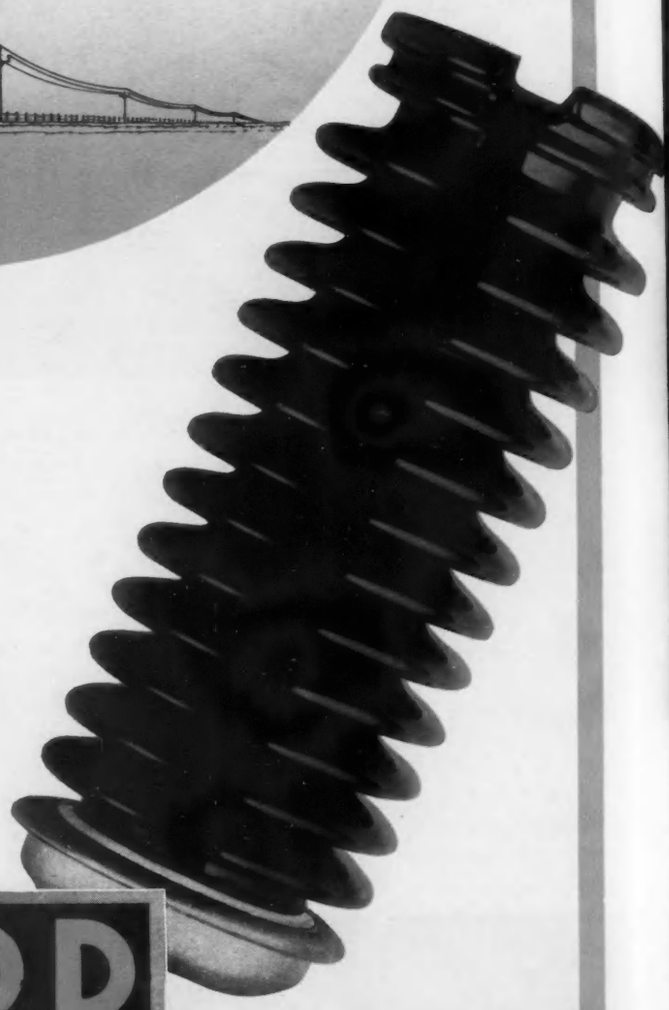
PLANNING NEW TRANSMISSION LINES?

INVESTIGATE THE ECONOMIES OF LINE POST *CONSTRUCTION*



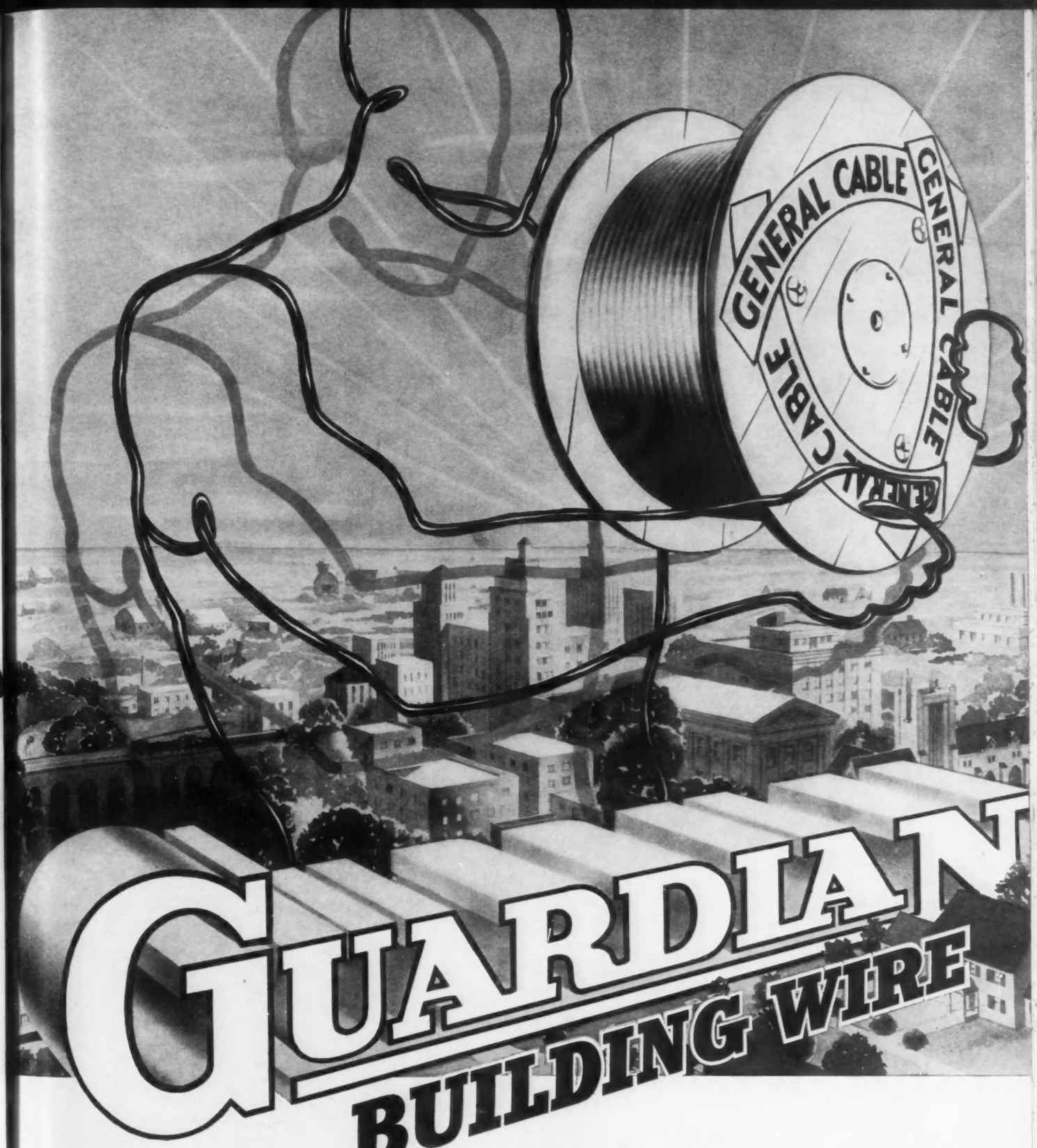
When extension of rural electrification calls for new transmission lines or conversion of existing lines to higher voltages, Lapp Line Post construction offers many advantages. Notable economy is effected both in original cost and maintenance. Being tall upright insulators, Line Posts require shorter poles and simpler crossarm construction. Because they stand up under more severe duty, they have fewer outages, require fewer replacements. Self-cleaning, the Line Post is acknowledged the most satisfactory insulator for service in salt air or industrial contamination. And by virtue of design features alone, it forever eliminates danger of radio interference. Ask for Lapp Bulletin No. 123.

MAYDWELL & HARTZELL San Francisco, Los Angeles



LAPP INSULATORS

APP INSULATOR CO. INC LE ROY - N.Y. - U.S.A.



A quality product from "stem to stern."
Not just a name and finish, but proven quality backed by a consistent merchandising policy.

SOLD BY ELECTRICAL WHOLESALERS EVERYWHERE

General Cable Corporation Sales Offices in Atlanta, Boston, Buffalo, Chicago, Cleveland, Dallas, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Rome, San Francisco, St. Louis, Seattle and Washington (D.C.)

THE STANDARD OF QUALITY FOR OVER HALF A CENTUR

RESISTANT TO

OKOLITE INSULATION

OKOLITE insulation permits the use of higher voltages—higher loadings. Not requiring a lead sheath, it avoids the wiping of joints, the effects of electrolysis and corrosion, sheath losses, and other disadvantages of lead.

OKOLITE is a high-voltage cable insulation developed upon extensive research—and backed with an impressive performance record. It has the resiliency and other desirable mechanical characteristics of rubber insulation. It is particularly resistant to heat, moisture and corona.

OKOLITE insulation is suitable for many classes of power cable. Its scope runs from a small control wire to a heavy generator lead—or a submarine power cable.

OKOLITE insulation is particularly adaptable for braided cables in wet ducts—or where there are high temperatures.

THE OKONITE COMPANY

Founded 1878

HAZARD INSULATED WIRE WORKS DIVISION

THE OKONITE-CALLENDER CABLE COMPANY, INC.

EXECUTIVE OFFICE: PASSAIC, N. J.

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OKONITE QUALITY CANNOT BE WRITTEN INTO A SPECIFICATION

GREATEST STRENGTH UNDER VARYING LOADS . . . another high spot in

TODAY'S TREND TOWARD PYREX POWER INSULATORS

PYREX is a Trade Mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

A HOME

• • • not just a building!

Genius may flourish in an attic . . . but solidity and refinement must be nurtured in more cultured surroundings.

It is the TRIANGLE belief that this philosophy may well be applied to the upbringing of electrical products.

This is a belief substantially evidenced by the TRIANGLE home. The ABILITIES of personnel can best function when the FACILITIES for serving are RIGHT.

TRIANGLE CONDUIT & CABLE CO., INC.

Horace Harding & Queens Blvds. ELMHURST, NEW YORK CITY, N. Y.

PACIFIC COAST DIVISION

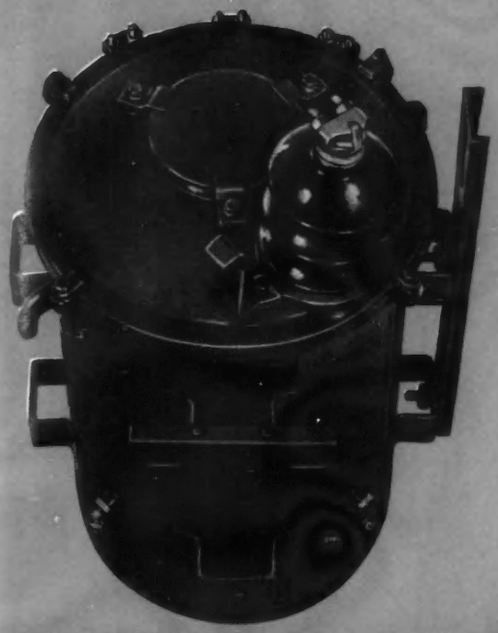
C. C. Hillis, Vice-President in Charge of Sales, 390 Seventh St., San Francisco, California

ARTERIES FOR ELECTRICAL

INCORPORATED

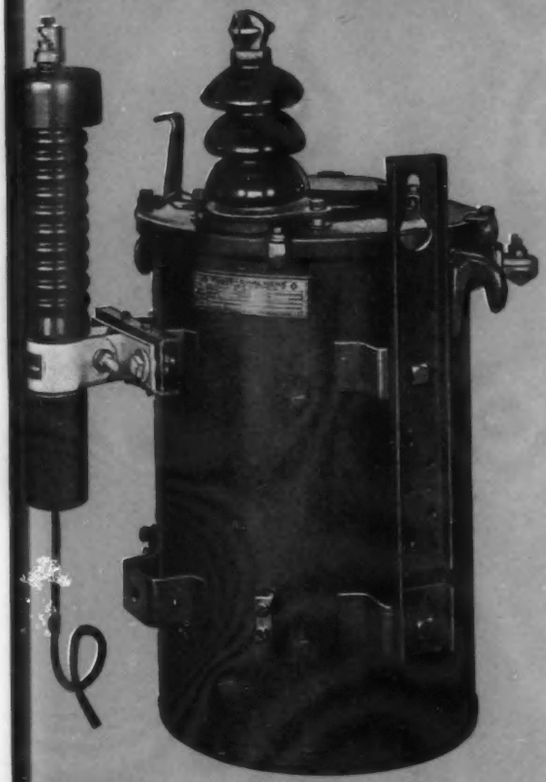
SYSTEMS

It **MUST** *be right!*



3 ADVANTAGES OF 3 POINT SUSPENSION

★HAE RURAL LINE TRANSFORMERS



1. Three sets of welded steel suspension brackets spaced 90° apart around the tank provide great flexibility in installations and make this transformer fit a wide variety of distribution line constructions.

2. The relationship between the high voltage bushing and the pole can be changed without disturbing gasket seals between the tank and cover. There are no mechanical changes to be made in the transformer—no time lost in installing.

3. Lightning arresters can readily be mounted on one of the two suspension brackets not used for supporting the transformer.

Type HAE High Efficiency Rural Line Transformers are made with the same engineering skill that characterizes every piece of equipment built by Allis-Chalmers. Send for Bulletin 2246 and find out how you, too, can lower installation costs and at the same time raise line efficiency to a maximum with HAE High Efficiency Rural Line Transformers.

814

TRANSFORMER DIVISION

ALLIS·CHALMERS

MILWAUKEE WISCONSIN

VARNISHED CAMBRIC • RUBBER POWER CABLES • BUILDING WIRE • RADIO WIRES • SIGNAL CABLE • FLEXIBLE CORDS • LEAD ENCASED AND PARKWAY CABLES • ARMORED CABLE • CRESFLEX NON-METALLIC SHEATHED CABLE • SERVICE ENTRANCE CABLE • MAGNET WIRE • BARE WIRE

Reel of large size
PARKWAY CABLE
in exceptionally long lengths used to feed power on a New Mississippi River Dam.

WESTERN REPRESENTATIVES

LOS ANGELES
Henger-Seltzer Co.
130 S. Hewitt St.

SAN FRANCISCO
Hodges & Glomb
1264 Folsom St.

KANSAS CITY, MO.
W. F. Howe
526 Law Bldg.

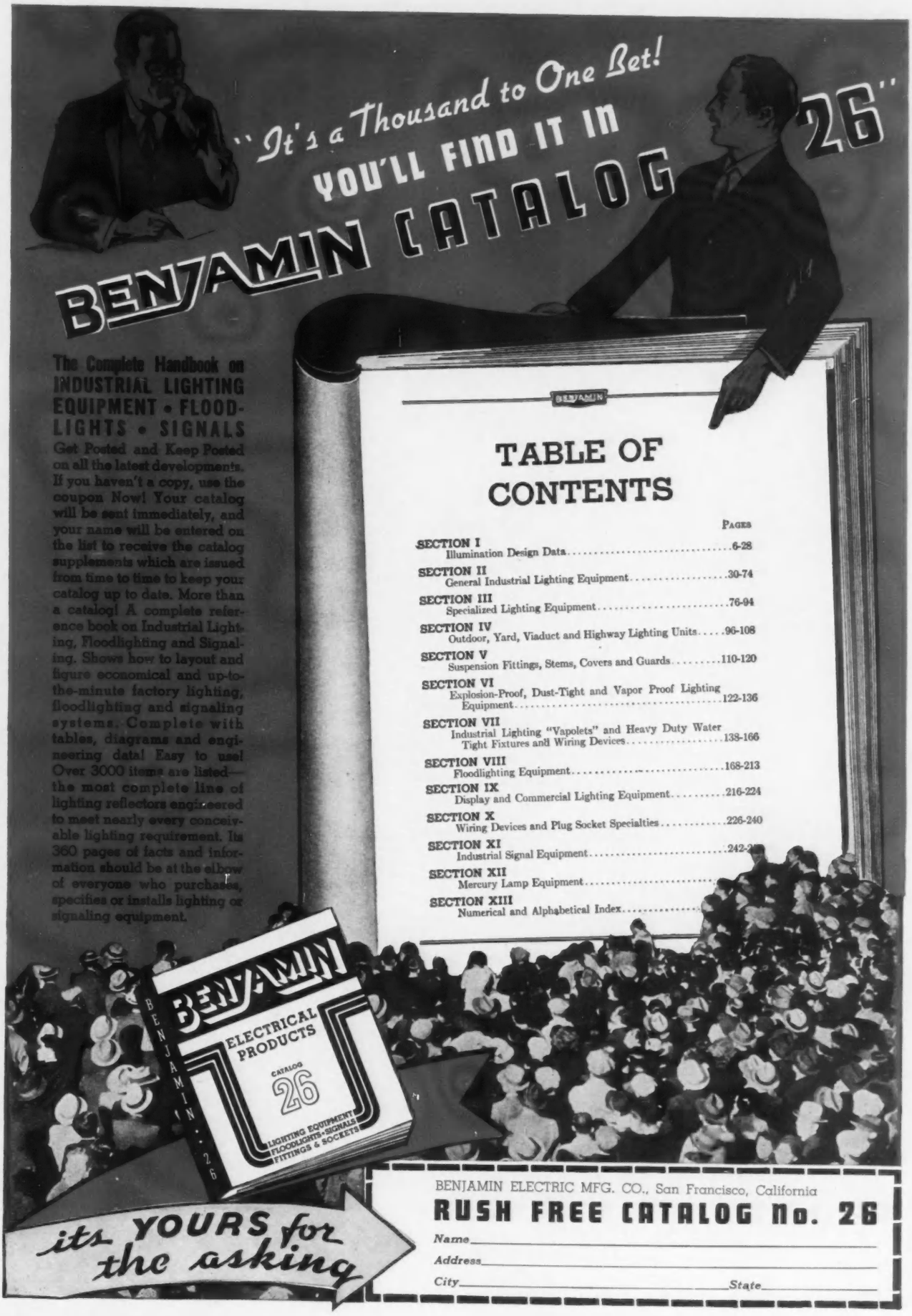
CRESCENT MAKES IT

Whatever the load—power for a mammoth dam or a simple house wiring job—the comprehensive CRESCENT line can furnish you with Wires and Cables exactly suited to your needs.

And Crescent can give you that close, personal type of service which you can expect from only a medium sized, closely knit organization, producing the entire line in one plant, under one management.

CRESCENT
INSULATED WIRE & CABLE CO. INC
TRENTON, NEW JERSEY

CRESCENT ENDURITE SUPER-AGING INSULATION • WEATHER-PROOF WIRE


"It's a Thousand to One Bet!
YOU'LL FIND IT IN
BENJAMIN CATALOG 26"
The Complete Handbook on INDUSTRIAL LIGHTING EQUIPMENT • FLOODLIGHTS • SIGNALS
Get Posted and Keep Posted on all the latest developments. If you haven't a copy, use the coupon Now! Your catalog will be sent immediately, and your name will be entered on the list to receive the catalog supplements which are issued from time to time to keep your catalog up to date. More than a catalog! A complete reference book on Industrial Lighting, Floodlighting and Signaling. Shows how to layout and figure economical and up-to-the-minute factory lighting, floodlighting and signaling systems. Complete with tables, diagrams and engineering data! Easy to use! Over 3000 items are listed—the most complete line of lighting reflectors engineered to meet nearly every conceivable lighting requirement. Its 360 pages of facts and information should be at the elbow of everyone who purchases, specifies or installs lighting or signaling equipment.
BENJAMIN
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BENJAMIN
ELECTRICAL PRODUCTS
CATALOG 26
LIGHTING EQUIPMENT FLOODLIGHTS • SIGNALS FITTINGS & SOCKETS
its YOURS for the asking
BENJAMIN ELECTRIC MFG. CO., San Francisco, California
RUSH FREE CATALOG No. 26
Name
Address
City State

General Electric does not make I.E.S. Better Sight Lamps, but is glad to publish this in the interest of better sight.

Light Conditioning

HELPS YOUNG PIANIST

LIGHT Conditioning is providing utilities with a dramatic new approach to the Better Light-Better Sight Program. And it is also developing the sales of more I.E.S. Better Sight Lamps.

Because these lamps . . . by providing the right amount of light and the right kind of lighting for Seeing, Comfort, and Beauty wherever eyes are used in work or play . . . go a long way toward light conditioning the average home.

That's why utilities will find it profitable to suggest the use of I.E.S. Better Sight Lamps to help customers light condition their homes. And why General Electric is promoting the use of I.E.S. Better Sight Lamps in its own Light Conditioning program. General Electric Company, Nela Park, Cleveland, Ohio.

"SEEING IS BELIEVING"

"Seeing is Believing" demonstrations this fall in many leading stores will sell more I.E.S. Better Sight Lamps. In these demonstrations, the Light Meter is used to show customers why these lamps give more light than ordinary lamps. This activity ties in with the Light Conditioning approach to the Better Light-Better Sight program.

MAZDA THREE-LITE LAMPS
100-200-300 WATTS
***only* 65c**

THIS MARK MEANS THEY STAY BRIGHTER LONGER

EDISON MAZDA LAMPS
GENERAL ELECTRIC

Economical-dependable

Long years of service on many important systems have demonstrated the economy and dependability of Locke pole line hardware.

These desirable qualities are constantly assured by rigid factory specifications and control. When your lines are built with Locke insulators and Locke pole line hardware you can be sure of speedy construction, low maintenance and long satisfactory life.

Do you have a copy of our catalog? If not, we'll be pleased to send you one. The up-to-date materials it illustrates may suggest new economies to you.

manufactured exclusively by

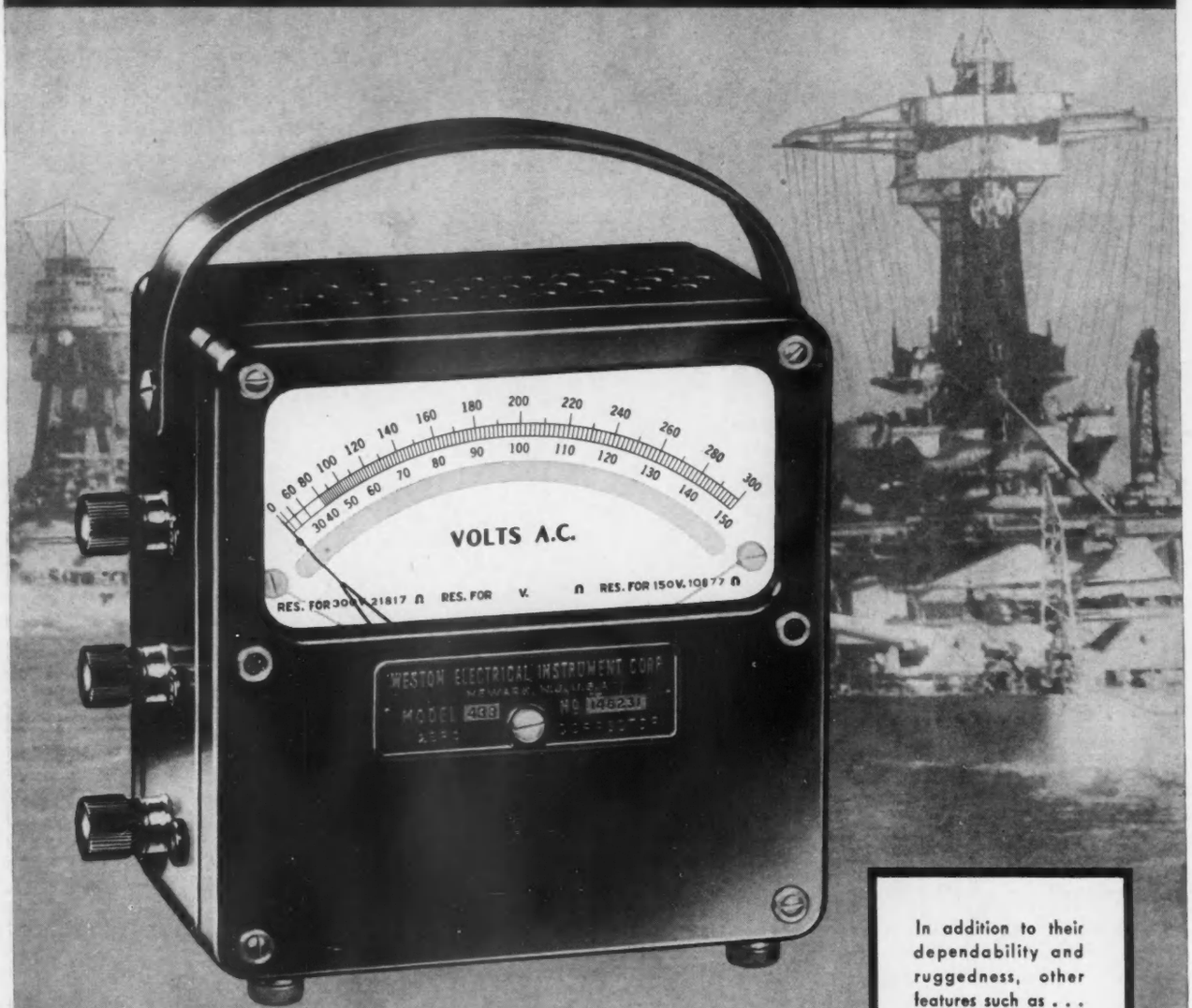
Seyler

MANUFACTURING COMPANY
PITTSBURGH PENNSYLVANIA

LOCKE
POLE LINE
HARDWARE

LOCKE INSULATOR CORPORATION
SHARPSBURG P. O., PITTSBURGH, PENNSYLVANIA

Precise... YET EXTREMELY RUGGED!



Efficient electrical maintenance work requires instruments which combine *enduring precision* with real ability to *take it*. Because the WESTON Model 430 Instrument series are ruggedly constructed to withstand the rigorous service encountered in daily maintenance routine . . . yet, throughout the years uphold the WESTON tradition for dependable accuracy, they are the preferred selection for maintenance work in shop or field. Weston Electrical Instrument Corporation, 577 Frelinghuysen Avenue, Newark, New Jersey.

In addition to their dependability and ruggedness, other features such as . . . wide open, legible scales—compact size—and low cost—have made Model 430 Test Instrument series universal favorites for all maintenance needs. Available in AC or DC . . . Send for complete details.

WESTON *Instruments*

PACIFIC COAST REPRESENTATIVES

Eicher & Bratt,
263 Colman Bldg.
Seattle, Wash.

Herman E. Held,
420 Market St.
San Francisco, Calif.

A. A. Barbera,
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Los Angeles, Calif.

VARNISHED Cambric Insulated Cables are showing superior advantages in many cases where loads have been increased. This type of insulation has the ability to withstand continuous high temperatures without deterioration, and it is not injured by contact with insulating or lubricating oils or greases. For these reasons it has become widely used for apparatus cables, and motor and generator leads where heat, high voltage and the effects of oil would shorten the life of rubber insulation.

American Steel & Wire Company Varnished Cambric Cables are available in either braided or lead sheathed insulation and are suitable for service up to 10,000 volts, and higher if lead sheathed or properly shielded.

For applications where heat resistance is of primary importance we have developed a special type of Varnished Cambric Cable which is even more resistant to continuous high temperatures than the standard type. Inquire about our "high-temperature" varnished cambric.

Loads have been increased and may be increased further. We will be glad to show you how our Varnished Cambric Cables can be of economical assistance to you.

VARNISHED CAMBRIC INSULATED CABLES

COLUMBIA STEEL COMPANY · *San Francisco*

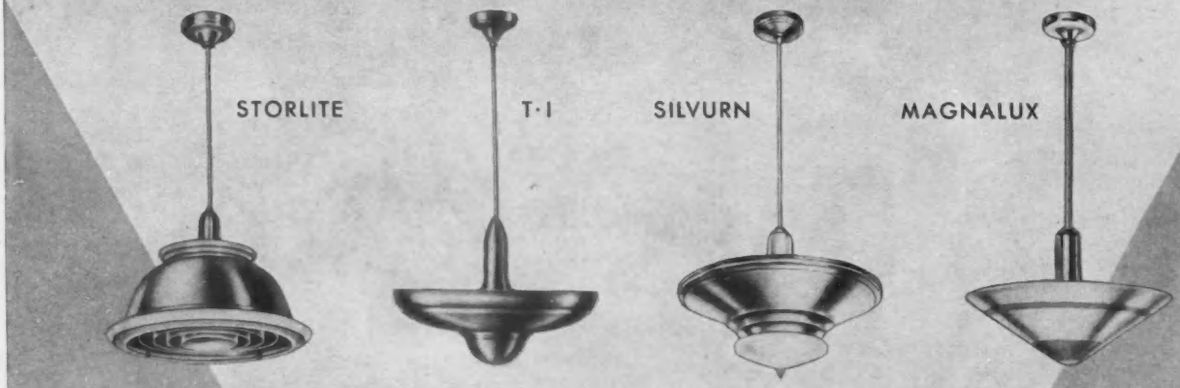
Pacific Coast Distributors of Varnished Cambric Insulated Cables for American Steel & Wire Company

United States Steel Products Company, New York
Export Distributors

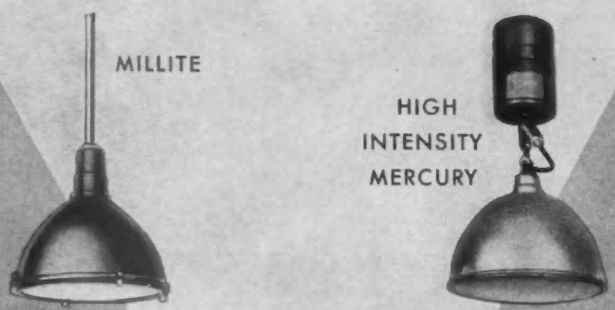
UNITED STATES STEEL

CASH IN ON WESTINGHOUSE

Leader Lighting Lines



COMMERCIAL



INDUSTRIAL

FLOODLIGHTING

WESTINGHOUSE MANUFACTURES THE MOST COMPLETE LINE OF COMMERCIAL, INDUSTRIAL & FLOODLIGHTING EQUIPMENT

LIGHTING COVERAGE

. . . of the Business Market

The "business market" represents a lighting potential that is *twice as great* as the lighting potential of the "residential market!" Today and possibly for many years to come, this will mean the best concentrated opportunity for *light-building sales and service* that is open to Electrical Contractors and Public Utilities.

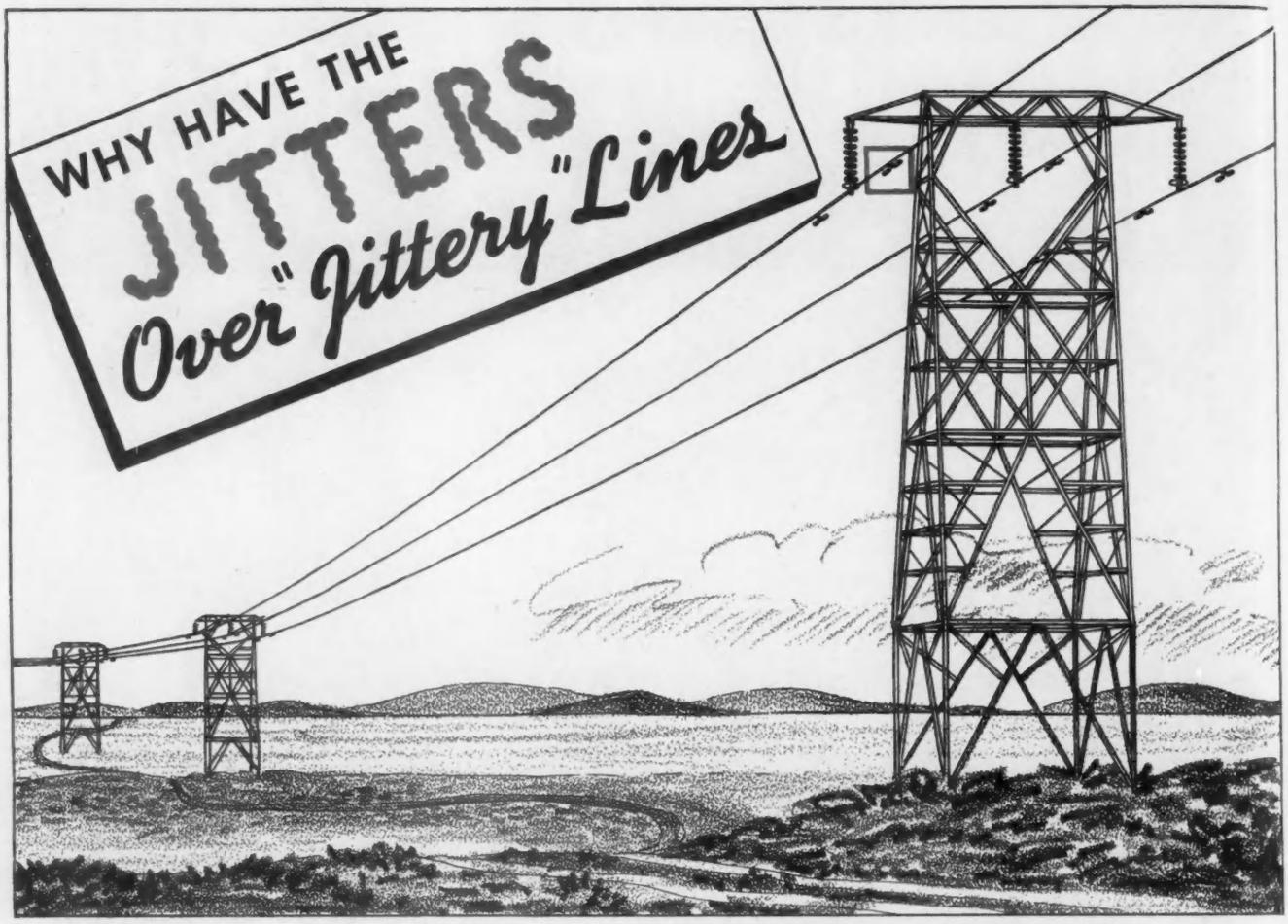
But light-building sales and service to the business market depend essentially upon the *availability* of Commercial, Industrial and Floodlighting equipment suitable for business applications. The Westinghouse Lighting Division specializes in the manufacture of such equipment . . . is, in fact, the largest manufacturer of lighting equipment specifically designed for the use of business establishments.

Westinghouse Lighting Coverage of the business market means: 1. *Product Coverage* . . . with a complete line that covers all types of Commercial, Industrial and Floodlighting requirements; 2. *Market Coverage* . . . with distribution through a well organized body of Jobbers covering all key centers of business activity; and 3. *Sales Coverage* . . . with representation throughout the business market by Lighting Specialists whose business it is to assist and co-operate with Electrical Contractors and others for the most profitable application of lighting principles.

For complete details on the Westinghouse Leader Lines for Lighting Coverage of the Business Market, call in your nearest Westinghouse Jobber Lighting Specialist; or write direct to Westinghouse Electric & Mfg. Co., Lighting Division, Edgewater Park, Cleveland, Ohio.

WHEN YOU THINK OF *Lighting* THINK OF

Westinghouse

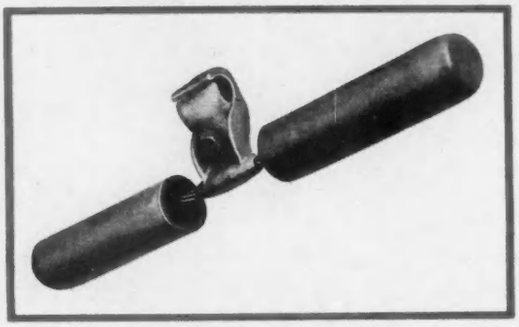


Rx Stockbridge Dampers Prevent *Line* Vibration

THE simplest way to protect your transmission lines against fatigue breaks of conductors at point of support is to use the Stockbridge Damper. This **practical** damping device offers the engineer the utmost in security and may be used with all types of conductors.

Again Hubbard pioneers a line construction specialty that saves money, time and labor. The Stockbridge Damper (patented) is manufactured by Hubbard and Company at Emeryville, California, for the seven western states.

Call upon our experienced and competent engineering staff to solve your special engineering problems. For prompt service on standard items of Hubbard Pole Line Hardware and Peirce Construction Specialties see your nearest branch of the Graybar Electric Company or the General Electric Supply Corporation.



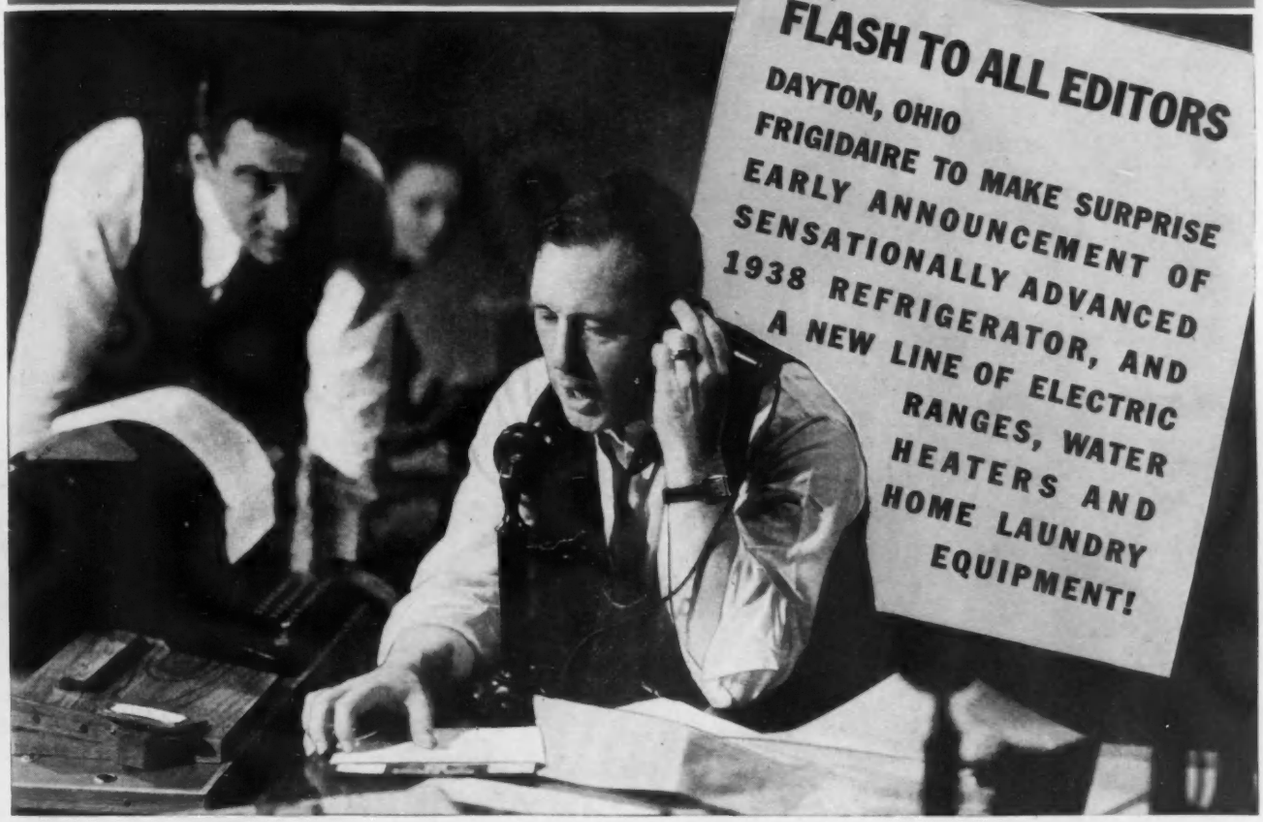
The Stockbridge Damper, shown above, is of rugged and simple design. It is easily and readily installed with hotline tools without disturbing existing suspension or dead-end clamps. There's a proper type for all conductor sizes.

Hubbard and COMPANY

OAKLAND, CAL. PITTSBURGH CHICAGO

The HARDWARE Makes the Line—HUBBARD Makes the HARDWARE

HOLD EVERYTHING!


FLASH TO ALL EDITORS
DAYTON, OHIO
FRIGIDAIRE TO MAKE SURPRISE EARLY ANNOUNCEMENT OF SENSATIONALLY ADVANCED 1938 REFRIGERATOR, AND A NEW LINE OF ELECTRIC RANGES, WATER HEATERS AND HOME LAUNDRY EQUIPMENT!

FRIGIDAIRE DEALERS TO GET HEAD START TOWARD BIGGER YEAR THAN EVER IN 1938!

● Frigidaire's about to make headline news again! Watch for the first details of the 1938 Frigidaire with sensationally advanced Meter-Miser, and scores of other new sales-clinching advantages! Get the details about the new Frigidaire appliances — ranges, washers, ironers, water heaters — that will give Frigidaire Dealers outstanding products in the major appliance field.

Thus, Frigidaire Dealers are about to get a head start toward a bigger year than ever before! The sales records they shattered in 1936 and 1937 will be smashed anew in 1938! For behind its new 1938 Frigidaire with the Meter-Miser — and behind each of its revolutionary new appliances—Frigidaire will put the same dynamic, compelling sales-strategy that has made Frigidaire the largest-selling refrigerator! And back that strategy up with the heaviest, most concentrated advertising campaign in Frigidaire history!

So HOLD EVERYTHING for next month's big Frigidaire announcement. It's going to be another Frigidaire year — with new and greater selling opportunities in the major appliance field!

FRIGIDAIRE DIVISION
General Motors Sales Corporation
Dayton, Ohio

FRIGIDAIRE
MADE ONLY BY GENERAL MOTORS

PERMAFLECTORIZED FOR BETTER LIGHTING

WHERE LIGHT IS SOLD

AS CONSUMERS naturally look to light and power companies for help and leadership in the use of artificial illumination, the most careful consideration was given the lighting of the City Light Building, Seattle.

Thorough physical and photometric tests were carried out before any lighting equipment was chosen, all of which resulted in a unique and outstanding installation. The illumination in this building is not only adequate and in advance of present practices, but the entire installation is designed with sufficient flexibility for adaptation to future advances in lighting art.

In the main display room, shown above (left) Permaflectors in pedestals and behind square glass plates in the ceiling combine to control the light in a way that shows the merchandise to its best advantage.

Above (right) is a view of the auditorium which is indirectly lighted with P-75-A Permaflectors spaced on 12" centers.

This is one of thousands of outstanding examples of Permaflector lighting.

Our engineers will co-operate with you in working out any lighting problem to the entire satisfaction of your customer. "Pittsburgh" engineers have a thorough knowledge of the proper uses for the different types of reflectors and accessories and there is no extra cost for their advice and service. Consultation with these engineers at headquarters in Pittsburgh or with field representatives is invited.

PITTSBURGH REFLECTOR COMPANY

OLIVER BUILDING PITTSBURGH, PA.

FRANK E. HASTINGS
810 Transportation Building
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RAYMOND ACKERMAN
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LYMAN D. MORGAN
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ARVIN *Fan-Forced* ELECTRIC HEATERS

They're Selling Fast

Because they're needed so many places—in homes, offices, stores, camps, cottages, ticket-booths, trailers, hospitals.

Because they're compact and portable and deliver full fan-forced circulating heat wherever and whenever needed.

Because they're priced for volume turnover. Your jobber will give you an attractive sales-building display with your initial order for two or more Arvins.

CALL AN ARVIN JOBBER AT ONCE AND ORDER THESE EXTRA PROFIT-MAKERS

No. 100 STANDARD $7.95 LIST

No. 200 DELUXE $9.95 LIST

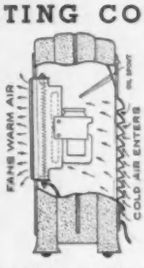
No. 200—The "tops" in portable heating comfort. Beautifully rounded lines, green enamel finish, chromium-plated grille. Equipped with handy snap switch.
Approved by Goodhousekeeping Institute and Underwriters' Laboratories.

Accepted and Approved — 1938 — Good Housekeeping Institute

No. 100—Economical portable heater. Compactly built of durable steel. Beautiful green enamel finish. Equipped with handle on top. Heating unit and fan fully enclosed.

STURDY, LASTING CONSTRUCTION

Fan motor is induction type. No radio interference. No attention needed, except few drops of oil two or three times a year. Fan draws air in through



rear louvres, past nichrome helical type heating coil, out through front grille. Operates on 110-125 volt AC, 50 to 60 cycles. Heavy gauge steel cabinet.

NOBLITT-SPARKS INDUSTRIES, Inc.
COLUMBUS, INDIANA • *Makers of Arvin Car Heaters and Arvin Phantom Filter Radios for Cars and Homes*

Large Stocks of Roebling *Rubber Insulated* Building Wire

AT LOS ANGELES — PORTLAND — SAN FRANCISCO — SEATTLE

Insure on the dot Delivery Service

All of the offices listed have ample stocks of code grade, also stocks of the more commonly used sizes of 30% grade available for delivery from warehouse.

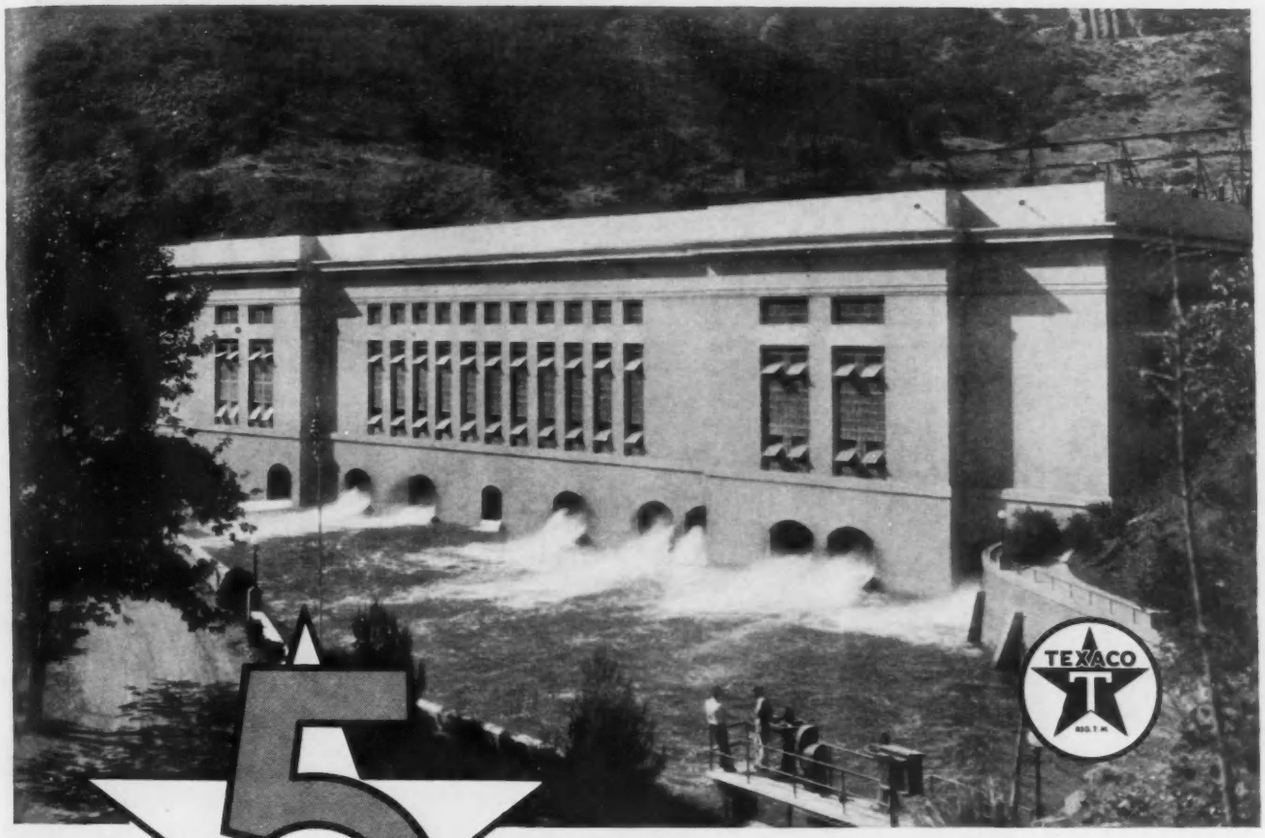
Made in types and grades for every purpose including:

Code Grade... Intermediate Grade
30% to 40% Performance Grade
35% to 40% Performite Grade
Solid or Stranded, Single or Multiple Conductor.

60 other types of Roebling Electrical Wires and Cables available.

JOHN A. ROEBLING'S SONS CO. *of* CALIF.
Los Angeles Portland San Francisco Seattle

ONLY A FINE PRODUCT MAY BEAR THE NAME ROEBLING



5-POINT *Protection!*

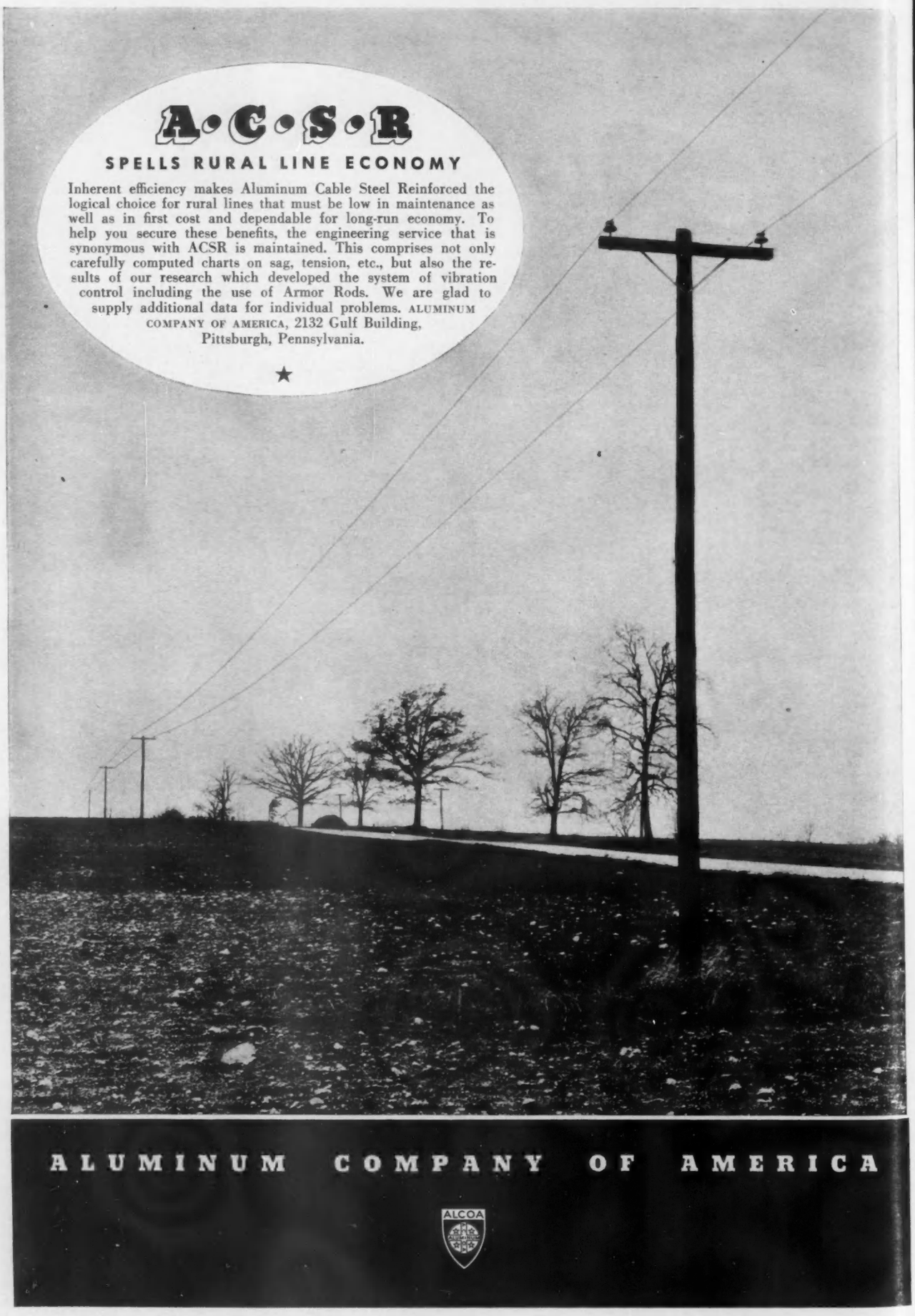
1. IMPERVIOUS TO WATER. 2. TWENTY GRADES TO CHOOSE FROM.
3. FREE FROM GUMMING OR CORROSIVE ELEMENTS. 4. RIGID UNIFORMITY.
5. DEFIES BREAKDOWN.

TEXACO STAR Greases were developed by skilled engineers who *know* hydro power plant needs...men who know what it takes to stand up under grueling conditions of heat, friction, moisture and pressure ★ ★ ★ TEXACO STAR Greases are designed to meet hydro plant needs for efficient lubrication. No farther away than your telephone is a TEXACO engineer, trained to prescribe the *right* grade for each need. Find out for yourself how TEXACO STAR Greases are helping to fight friction, corrosion...to keep hydro-electric power plant equipment in profitable service.

THE TEXAS COMPANY • A CALIFORNIA CORPORATION

TEXACO *Star* GREASES

OTHER TEXACO POWER PLANT LUBRICANTS: TEXACO MARFAK • TEXACO URSA OILS


A·C·S·R
SPELLS RURAL LINE ECONOMY
Inherent efficiency makes Aluminum Cable Steel Reinforced the logical choice for rural lines that must be low in maintenance as well as in first cost and dependable for long-run economy. To help you secure these benefits, the engineering service that is synonymous with ACSR is maintained. This comprises not only carefully computed charts on sag, tension, etc., but also the results of our research which developed the system of vibration control including the use of Armor Rods. We are glad to supply additional data for individual problems. ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh, Pennsylvania.
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ALUMINUM COMPANY OF AMERICA
ALCOA

"Dear Santa:"

Dear Santa:

The new electrical appliances make such swell presents, we'd like to have an all-electrical Christmas this year. Please send us a and a also together with and a and also

Yours,

John + Mary Public

~~NOTE~~ TO DEALERS:

Graybar's complete line of appliances of all leading makes will help you give the public what it wants.

OFFICES IN 83 PRINCIPAL CITIES • EXECUTIVE OFFICES, GRAYBAR BUILDING, NEW YORK, N. Y.

Midget Metal-clad Switchgear

They SAVE even BEFORE they're installed

THAT'S the way with metal-clad units. Because you immediately eliminate the expense and delay of piecemeal buying. You may also avoid the need for extra construction—metal-clad is compact and saves space.

Your installation costs are kept to the minimum because you receive your metal-clad units completely assembled. You need only set them in place and connect the cables.

From that time on, through years of efficient, low-cost operation, you continue to receive the benefits of metal-clad. No guesswork about the adequacy of circuit protection—the G-E oil-blast breaker is conservatively rated, its action fast and positive in emergencies. No doubts about safety—G-E metal-clad is enclosed in grounded steel compartments. Proper operation is assured by a system of interlocks. Maintenance savings continue because silver main contacts in the breaker and silver disconnecting devices prevent heating.

G-E midget metal-clad—Type MI-9—ratings: 600, 800, and 1200 amperes, 2500 and 5000 volts, 25,000 and 50,000 kva

Larger metal-clad equipments—Type MI-6—are rated up to 2000 amperes, 15,000 volts, 75,000, 150,000, 250,000, and 500,000 kva

Ask your G-E representative for complete information. General Electric Company, Schenectady, N. Y.

880-28

GENERAL ELECTRIC

ELECTRICAL WEST

DEVOTED TO THE ECONOMIC PRODUCTION, TRANSMISSION AND DISTRIBUTION OF ELECTRIC POWER AND ITS APPLICATION TO INDUSTRY, COMMERCE, AGRICULTURE AND HOME IN THE PACIFIC EMPIRE, AND TO THE MARKETING OF EQUIPMENT AND APPLIANCES AND OTHER UTILIZATION DEVICES IN THAT AREA

October 1937

Confession of an Electrical Contractor

My early training and why it makes me think and act the way I do

I AM more than a little tired of hearing the electrical contractor run down. Those of us in this line of business in the electrical industry are said to be all sorts of uncomplimentary things, some printable, others not. We are accused of being poor salesmen. We cut down the job, rather than build it up, it is claimed. Our sole interest, we hear said, is in bidding for work instead of selling up the job. We are told that we do not cooperate. Our efforts are mostly spent, others say, in trying to fix prices, or fix jobs, or other artificial means of boosting our profits rather than by the more legal and harder way—selling. We are said to be ordinance concious, trying to regulate ourselves rich, or to keep others out of the business. Then when the ordinance pinches us in some tender spot, we are accused of bootlegging wiring or slipping by with a "fast one."

In varying degrees, I suppose every one of these accusations is true. But how many of you trouble to do more than condemn the effect rather than dig down and help us find the causes and seek a cure by changing or removing these? The way I look at it, we can harp on these evils until we are blue in the face and not make the slightest impression on them. Maybe something can be done about the *reasons* we contractors think and act the way we do, but if it is, it will have to start way back to our early training. Take my own case as an example:

Like a lot of kids who are mechanically inclined, I had trouble with some of the stuff taught us in schools and was anxious to get out and do something I liked. I had fussed around with the electrical gadgets of my time—doorbells and telegraph tickers, and magnetos and spark coils. Electricity appealed to me and I left school when I had a chance to run errands and be general roustabout for an electrical shop. They used to send me out on a bicycle with a sack of split knobs and coil of wire and loom to the journeyman wiring up an old house. I hung around watching the journeymen and I guess I begged for a chance to start in as an apprentice.

It wasn't long 'til the journeymen started talking to me about joining the union so that I could get the apprentice's scale based on the length of time I had worked. One day the business agent tackled me on the job and I signed up and paid my initiation fee and dues.

Electrical Education

Up to the time, as I look back now, I didn't have any particular ideas about business or labor or this thing called economics. I was anxious to work instead of going to school, and I thought that was all there was to it. But I was wrong. My education was just beginning at that point. It went in two directions. First by sheer necessity, I had to learn more than I had in school about electricity, ohm's law, how to figure amperes, voltage, and that sort of thing. I had to brush up on arithmetic and learn the meaning of words, because I had to read a complicated little book called "the code" and try to decide what it meant.

But what few people in the electrical industry realize, and I am just beginning to myself, is that I was learning something else—a point of view. That point of view is very much in evidence today. It has almost become a creed, but I wonder if it really has any real ground to stand on.

The point of view, in a few words, is that the world, or the boss, owes you a living, and you have to fight to get it.

In the union meetings that I used to attend regularly I can remember the theme song was always to the tune of self pity—we poor suckers were being gyped out of our just deserts, and we needed to organize to keep from being exploited, to demand our share of what we produced, and to keep from being worked too hard. It was easy to believe that sort of story, and it wasn't long before I felt good and abused at just about anything at the drop of the hat. I was young, and liked a fight, and this militant attitude appealed to me then.

But I can see now that it was doing something to my attitude which stayed with me now that I am boss myself and hiring men to work for me. It is hard not to have suspicion, once you are nursed on it, and nowadays my suspicion is exercised on my competitors, on the other and sometimes bigger branches of the industry, and on the general contractors. The militant attitude toward them comes all too natural and too easy.

When you stop to analyse it, what a union is really trying to do is to create a monopoly of labor in its field. It wants everyone working in that field or craft to belong so that it has the strength of their united willingness to work or not to work to club the employer group into dealing with the organization only. It seeks to keep the "outsider" from getting any work, and thus forces him to join, or quit trying to work.

How many contractors carry over

from their union days this same attitude? There is a constant attempt to tie things up tight so that the "outsider" who does not belong to the association must either join or go broke. All sorts of schemes are tried to create a monopoly in fact, if not in name. And unfortunately, just as in union days whenever we had a strong organization we often lost our heads and tried to get far more in wages or working conditions than the traffic would bear, so in contracting we often go too far in trying to set prices or protect bidders above what the service is worth and sometimes dig ourselves into a fine public scandal.

But if our education, ever since we joined the industry as an apprentice, has been along these lines, who can blame us for seeing things through eyes that look toward organizing to control things our own way? Our unions never concerned themselves with what the customer for our work or the boss thought about it. Come to think of it, it was never even suggested to us that the only reason we were necessary at all was to do something that some customer needed or wanted or could be made to want if he was told about it. So it is not surprising that the sales point of view has been lacking in our education. We were all concerned with what we could get for ourselves—first as a wireman from the boss who hired us, and later as a contractor from the competitor who was against us. The customer, if he ever came in for anything, came in for the extras.

I Enter Business

One day, I remember, I had the notion that as long as the boss was getting rich off me, I might as well go into business for myself. Wasn't he paying me 75 cents an hour and charging $1.25 for it? He had lots of work and he rode around in a car and spent money on liquor and good times. Why shouldn't I run my own business and get some of that money to have a good time too? I had saved up a little nest egg. I knew the jobber salesman. I knew a lot of the customers I worked for and I could offer them a better price than my boss charged and still make plenty.

It took some pretty hard lessons to teach me finally that all wasn't gravy between what I charged for my work and materials and what I paid for them. After taking some of the boss' best customers I found that he retaliated by cutting prices too. First thing I knew I had a whole gang of contractors fighting over every job with me, and I couldn't seem to pay all my bills for some reason or other.

There was telephone, and the car I bought, and gasoline, tires, and repairs. I had to rent a place big enough to store my conduit and wire and tools. I had to buy more tools, and they often turned up missing. There were bill heads to print and collections to make, and bad accounts to worry about and finally give up for lost. My men didn't seem to turn out much work for what I paid them—not anything like what I had to do myself to make ends meet. I had forgotten that they, like myself, had been told by the older men not to kill themselves working too hard, to make the job last longer if they could.

Though this kind of "hard-knocks" education started coming soon and it kept up steadily, it took me quite a while to appreciate just what it all meant. I kept blaming the other contractors for being chiselers and dirty double-crossers, without remembering that some of my own actions weren't so clean either. When I finally did get it through my head that I had to learn to be a business man as well as a mechanic, I had developed into a sour ball along with it.

> Does the negative, fault finding philosophy of the Unions haunt the workman and contractor all his business life? Isn't there a constructive philosophy Unions might teach to place a premium on the union trained man for his superior worth?

Often there was talk about cooperation and playing fair among us competitors but it never seemed to go very far when there was a job at stake. Some of those who talked nicest in meetings of of the association seemed to do some of the lousiest stunts to get a contract. Some of the stunts, I soon discovered, were the result of special deals offered them or that they could phenagle out of a wholesaler or a manufacturer who seemed just as anxious as they were to buy the job at any cost.

You Can't Trust Anyone

You can't exactly blame me now for being gun shy of talk about cooperation, and playing the game, coming from some of the heads of some of the very firms I know or suspect of entering into some of these special deals. If there is one lesson I have learned as a contractor, it is that you can't trust your own brother. What chance is there to trust your wholesaler, manufacturer, or utility any farther than you can throw the building? So when someone talks about cooperation now, I have to see it in black and white, signed on the dotted line, and it has to mean that I get something out of it as well as the other fellow.

Contractors have to be like cats—with nine lives, and always able to land on their feet. The nature of the business demands it. They have to live by their wits. And nobody who has not been a contractor can imagine the number of things a contractor has to keep in his head at one time.

One Man Business

Most of us run one man businesses. That means we have to go out after the work—the easiest way is to go ask to put in figures. It means we have to do the estimating, and that often takes nights of painstaking take-off on plans and specifications. We have to negotiate with several suppliers of materials—not only electrical materials but often building and mechanical materials like concrete and machine work, sheet metal, and the like. We have to attend to the bills and collections, do the banking, meet the payroll, watch the timecards. If we are running a few jobs it means ordering materials and arranging deliveries, picking up little details that are missing—such as a dozen locknuts or a special box cover. Permits have to be obtained from the electrical department, and often that calls for a set of plans, and several trips to decide details as to how certain runs are to be made or circuits grouped. There are the annual licenses to pay, sales tax and social security now to keep track of; taxes to pay, both personal property and income—state and national. There is liability insurance and insurance on the car. There are association meetings and dues and fees to be paid on percentage of volume. But why go on.

If I had had any idea of all the headaches I would run into when I decided to quit working with the tools and be a contractor, perhaps I might have had sense enough to stay working at good wages and be content to let my boss earn a little—if he could—on the fact that he was out chasing up work for me to do.

Why do we contractors cut down on the job? In order to get it! That's simple. But let's see why we think of a job as a prize instead of a sales opportunity. Part of the way of thinking that we were taught in the union was that we owned a right to our job, just as though it was a piece of property that was ours by some divine right. I don't know just how that idea ever started, but if you take it apart with cold reason it hasn't much to justify it except that you want to believe it. Stop to reason it out and the first thing you know you can't find any "right" to it.

A job is something that comes about

as a result of somebody else needing something or being made to want something.

It has to be created by the customer. But from the union viewpoint you would think that there were a certain quota of God-given jobs and that they had to be divided up, and once you put your claims on one, it was yours—like a newsboy's corner.

When I decided to be a contractor, I carried that idea over with me, but instead of my supposed right to a job for one certain boss or firm, I took on a proprietary attitude as to my customers, and I noticed that every other contractor did the same as to his customers. Once a man was my customer I thought I had a right to him for all his future work, and when someone else tried to get him away from me by a cheaper price, I resorted to the only device I was trained to use—retaliation—to keep my property, my customer. And believe it or not, my warped idea of the way to keep him was to give him an even cheaper job. Whether that cheaper job was good for him, or was what he needed, or really in his interest never came into the picture. It was his tough luck that he wanted competition.

Fairness Keeps Customers

It took me a long time in business to see that the best way to keep my customer was not to gyp him but to take better care of his wants and needs than anyone else knew how to do. The sales point of view does not come easy to a man who is schooled in this other way of looking at his job.

Which just brings me back to the purpose of this confession. As I look back through my experience I can appreciate what a lot of heartache and headache I took on for myself because I was mis-educated on some of the facts of business life. The worst part of it is that I see the kids who are starting with me today heading for the same false thinking—with the same headaches ahead of them, no doubt.

Yet out of it, I can't say that the entire union idea is wrong. Somewhere along the line I seem to have caught an idea or a hope of what the purpose of organized labor might be. Of course the trouble is that the loudest talkers oftenest on their feet on the floor of the meetings seem to be those who are born with an ingrown grouch against everything and everybody. Too often the sober element gets tired of fighting them off and lets them run things to suit themselves, hoping that hard knocks will teach them the same lessons they learned by experince.

I don't think that the "fight" idea is right. It starts out with a chip on the shoulder and before you know it, everybody is a so and so. In the few years since I have learned better, it seems to me that fighting for something is the hard way to get it. The other side always fights back and that means twice as much wasted energy.

Give Youngsters More Training

If we are going to see more unionization, I'd like to see a leadership that would start a youngster out to teach him as thoroughly as unions often teach him the code rules and wiring methods, to think constructively and to learn the business end of the game as well as the mechanical. Seems to me journeymen trained in that frame of mind would help their employers to create more business for both of them. Seems to me if such journeymen decided to go into business they'd do so with their eyes open, and they would make good competitors and straight-shooting employers of their own craft. And I have a hunch that if we were all schooled in thinking about who it is, after all, that makes our business and our jobs possible—the customer—we'd be slow to try to force him to do unreasonable things just because we wanted to protect our own profits or what we fondly imagine are our "rights" to a job, a customer or a contract. We might try harder to suggest ways for him to use more electricity conveniently. We would perhaps even take a second look at some of the ideas brought forth to do more wiring for less money, knowing that out of more volume there would be better prosperity. Can't help thinking we'd have less labor troubles with their lost wages and bad blood.

I don't know for sure, but I'd like to see it tried.

Air Conditioning Standards Adopted by Society

"Where installations are made below minimum requirements, they should be called by some other name than Air Conditioning," thus the forward of the California Standards of Air Conditioning for Human Comfort sets forth the purpose of these standards recently developed by the Air Conditioning Society of San Francisco. The recommended California Standards are based on a number of other sources, among them guide of the American Society of Heating and Ventilating Engineers, and various codes of air conditioning manufacturers. The other codes have been adapted to meet the particular conditions existing in California.

To eliminate the confusion in use of technical terms the Standards start off with a list of definitions of the terms employed. Next come the specifications of the standards themselves. Sections and headings include: Scope, Design Coefficients for Heat Transfer Through Various Building Construction and for Heat Gains from People or Appliances, Minimum Standards for Cooling Apparatus, Minimum Design Temperatures and Humidities for Comfort Heating, Minimum Design Temperatures and Humidities for Cooling, Infiltration and Leakage, Design Load Calculations, Design Allowance for Shading From Sunshine, Design Air Quantity, Design Duct Capacity, Design Air Distribution, Refrigerating Apparatus and Refrigerants, Heat Transfer Apparatus, Noise Control, Air Filters, Insulation, Guarantees, and General Recommendations.

The Standards were prepared by a Standardization Committee headed by C. C. Hardy.

10 Reasons For Attending the N.E.C.A. Convention

Biltmore Hotel
Los Angeles,
Oct. 18-21, 1937

1 Ideas to build more business from seven features of the program.

2 Ways to develop better relations with the industry from 6 features.

3 Methods to operate your association more effectively from 3 discussion sessions in the contractors only program, on Wednesday.

4 Motor and repair shop discussion on two occasions on the program.

5 Opportunity to talk to speakers and others from all parts of the country on particular problems.

6 Acquaintance with men you can write to for more information.

7 An "Exposition Extraordinary" where you can see all the newest materials and devices displayed and explained.

8 Chance to see many fine electrical jobs and bring home new ideas.

9 Visit interesting places, such as Mexican village, Mt. Wilson observatory, and other points of interest.

10 A wonderful time with good fellows.

Where Cooperation

between Contractors and Utility in

Official news publication of the association

COOPERATION works when it pays. No amount of spoken cooperation seems to last long without a tangible reward in the equation. Moreover, both parties to the cooperation must derive benefit from the transaction if it is to last.

With this common sense premise as a starting point, the cooperative arrangement between the British Columbia Electric Railway Co., and the Vancouver Electrical Association, a contractors organization, has proceeded for 5 successful years. It has continued on a basis of mutual self respect and responsibility. The interesting thing about this relationship is its frank facing of issues which are so often avoided by other utilities and that cause so much antagonism toward the utility on the part of contractors because they are not faced.

The two parties to this negotiation were hard headed business men. On one hand were a group of sincere and yet realistic electrical contractors who constituted the executives of two associations, one of residential, the other of commercial contractors. On the other hand there was a utility sales manager who knew the realities of the contracting situation because he had been a wholesaler and had tried his utmost to help contractors organize for better profit and business.

He knew, did W. C. Mainwaring, general sales manager of B. C. Electric Railway Co., what a contractors association needed to make it successful—it needed the full support of the utility and the wholesaler—tangible and genuine support, expressed in real business. He felt that if he could make it worth while for contractors to belong to the association, they would belong, and they would then assume responsibilities that were necessary if they received the business of the utility.

Meetings were called between the two antagonistic contractors' associations and the utility. The cards were placed face up on the table. Mr. Mainwaring made it plain that he had business to offer, but he did not want to offer it to any individual. If the two groups could reconcile their differences and develop a plan for the dispatching and handling of the utility's business, he would place every bit of his business through the association. On the other hand the association would assume the responsibility to perform the work expeditiously, with high grade materials, and in a satisfactory manner. It would help the utility to sell more electrification, and it would endeavor to enlist every electrical contractor into its association and program.

Reorganizing the Associations

The contractors immediately buried the hatchet, set about to reorganize the two associations into the Vancouver Electrical Association, and set in motion the machinery to handle the wiring business placed in its hands by the utility. Later negotiations developed the details whereby an audit each year of the cost of doing this wiring could be analyzed and revisions in the schedules made on a basis of fact. These details are outlined later in this article.

With this concrete inducement to membership the association soon began a constructive program to develop still further services to its members, services equally beneficial to the electrical industry.

Arrangement was made with the wholesalers to render them a cooperative service as well by publishing of "Current Market Quotations." Current market wholesale prices (F.O.B. Vancouver) of the standard construction materials, such as conduit, wire, fittings, etc., are obtained from the wholesalers, correlated and then published in loose leaf form. Each wholesaler is supplied with the number he wants for his customers, on a color of paper which is distinctive to his firm, and with the imprint of his firm on the back. Thus the wholesalers obtain the economy of a cooperative price service through a neutral agency and each merely pays his share of the actual cost of compilation. At first this quotation service was run as a part of the V.E.A.'s little magazine, "The Electric Eye," but now it is supplied in individual sheets to the various wholesalers for their own distribution.

"The Electric Eye" was another feature developed by the association. Its purpose has been to keep members completely informed of local, provincial and industry activities, programs, and news pertinent to the contracting business in British Columbia. Local advertising from manufacturers, wholesalers, and the utility supports this interesting little publication.

Another service started as an association activity but now run by its former secretary, J. C. Reston, and handled through the association, has been a resale pricing guide. Because of import duties and other similar conditions none of the resale services available in the United States or even in Eastern Canada are adequate for British Columbia. The resale pricing service, published on pocket sized sheets for a loose leaf book, by mimeograph, has been a valuable aid to contractors not only in Vancouver but in other towns and cities in the province.

A credit information service is another asset offered the member who belongs to the association. Through a quarterly fee which the association pays to a local credit bureau, members of the V.E.A. may phone to the office of the association for credit rating of any customer. The office obtains the information for the member and relays it back to him. No extra cost to members is assessed for this service.

Handling the Utility Work

How the details have been organized to handle the utility's work is particularly significant and well thought out. One of the first activities that the utility engaged upon was an outlet campaign. The wiring for ranges and water heaters and for lighting installations developed by its sales forces is now handled through the association.

For the outlet campaign the cost of installing an outlet in an old residence was analyzed thoroughly, and a scale made. The utility advertised a special offer on convenience outlets at these prices, to be paid for by the customer with the electric bill. The utility salesmen sold the idea, took the orders, and placed them through the association. The association arranged to rotate the

Works —

British Columbia

jobs among its members on a basis of location of the work and other factors.

A system of forms was worked out to handle the billing and accounting for this utility business. The contractor, to speed action in providing service to the customer, is sometimes notified immediately by telephone by the association. He is told what the job is to consist of, and other pertinent information. He is then sent an order in duplicate in the form of a bill back to the association. (See illustration top of this page.) This contains the V.E.A. order number, and a description of the work to be performed.

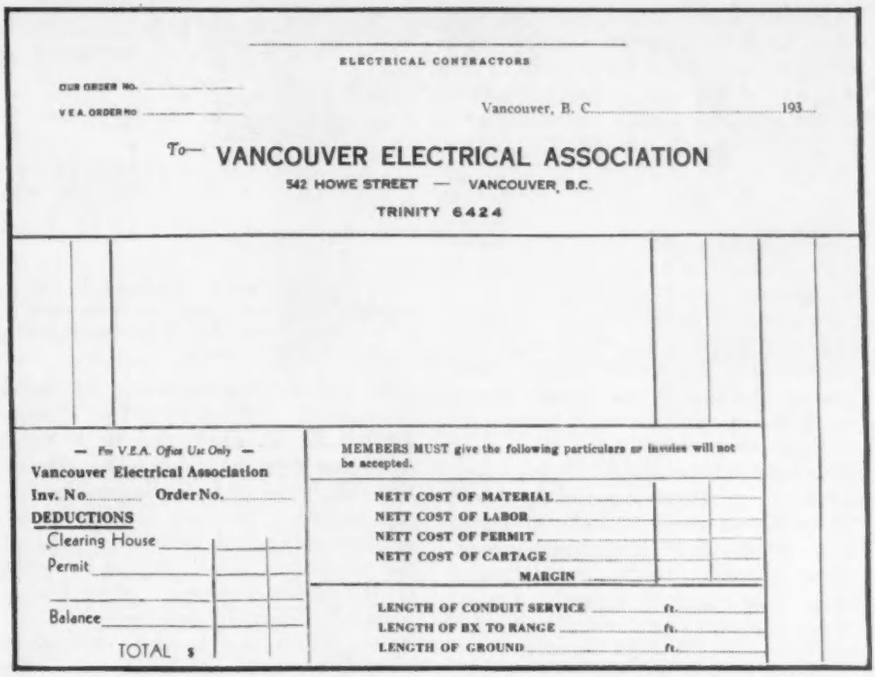
Good Materials Insured

To insure first class materials an arrangement has been made with the wholesalers whereby the contractor takes the order form to the wholesaler, purchases the materials required at a special discount agreed upon. The wholesaler bills the material to the association, which pays for the material out of the payment made by the utility.

The contractor in turn bills the association for the job, and lists on the form the net cost of the material as supplied him by the wholesaler, the net cost of labor, the net cost of the permit, and of cartage, and the margin due him. He is also required to list for statistical purposes the length of conduit service, the length of Bx to the range, and length of the ground.

Before paying the contractor, the association receives a clearance from the utility that the work is satisfactory (if not, it requires the contractor to make it so) and then deducts from the amount due the contractor the cost of the materials (for which it pays the wholesaler immediately), the permit (which it pays to the city direct so as to expedite the approval), and a clearing house fee of 5 per cent to take care of the overhead and accounting done by the association.

Payments are made to the contractor once a month. To simplify bookkeeping, the back of the check to the contractor is rubber stamped with a form on which are entered all of the jobs for which the check is in payment. The order numbers are listed, invoice totals, clearing house charges, permit fees deducted. Then the member's dues of $2 a month, his price book service of $2.50 if he uses the price book, are also deducted. When the contractor endorses the check he accepts the statement and the transaction is complete.



ELECTRICAL CONTRACTORS

OUR ORDER NO. .....

V.E.A. ORDER NO .....

Vancouver, B. C. ..... 193....

To— VANCOUVER ELECTRICAL ASSOCIATION

542 HOWE STREET — VANCOUVER, B.C.

TRINITY 6424

— For V.E.A. Office Use Only —

Vancouver Electrical Association

Inv. No..... Order No.....

DEDUCTIONS

Clearing House .....

Permit .....

.....

Balance .....

TOTAL $

MEMBERS MUST give the following particulars or invoice will not be accepted.

NETT COST OF MATERIAL .....

NETT COST OF LABOR .....

NETT COST OF PERMIT .....

NETT COST OF CARTAGE .....

MARGIN .....

LENGTH OF CONDUIT SERVICE ..... ft.

LENGTH OF BX TO RANGE ..... ft.

LENGTH OF GROUND ..... ft.

Combined order form and bill for handling the utility's business through the association

The information thus obtained is used to serve a useful and beneficial purpose. A summary of the work done each year is made. This summary breaks down completely all the factors in cost and profit and serves as a basis for reviewing with the utility the scale of charges to be made for the work. In this way the negotiations are carried on in a business-like and mutually enlightened manner, and the facts decide the result. All chance for bickering over whether wiring costs too much or too little is eliminated in this simple business procedure.

Work Averages $1000 a Month

At the last annual meeting in May the secretary, S. F. Ricketts, reported that the work received from the power company during the past 12 months totaled $12,299.65, an average of over $1,000 a month distributed over the various contracting firms in the association. The wholesalers have been paid promptly, which justifies the mass price they give the association for the materials purchased for these utility jobs. And the residential contractor, particularly since he gets the most benefit from this program, can count upon a certain minimum of work and a check from the association on a given date each month.

The secretary's report also revealed that while this arrangement with the central station has been extremly satisfactory the membership had been much more active on their own behalf and had aggressively engaged in cooperating with the central station in the promotion of new business which had proved beneficial to all parties concerned.

In its own association affairs the V.E.A. makes a constructive effort to solve or at least improve some of the competitive conditions existing in the business. The membership, according to the secretary's report, averaged 65 members, practically every contractor in the city of Vancouver. Attendance at meetings averages 30, or 46 per cent of the membership. Beside the strictly business meetings, held on the 1st and 3rd Wednesday evening each month, an educational meeting is often held to provide members an opportunity to hear of new developments, materials, methods or promotional programs in the industry. Social meetings such as dances and outings are an excellent means of improving the friendly relations between the members.

No Paradise Here

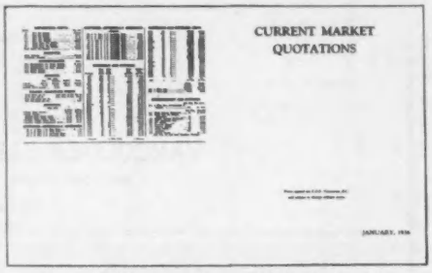
Lest it be thought that the Vancouver group lives in a special contractors' paradise, the association still struggles with price cutting and seeks ways to improve the general standard of business ethics. The residential wiring contractors have discussed outlet costs and sought to arrive at some gentlemen's agreement as to minimum prices, all the while stressing the desirability of approaching all jobs on an estimate basis, forgetting the words "outlet" and "outlet price" in quoting to customers. Considerable progress was reported in talking in terms of workmanship rather than price, and in the public acceptance of this approach.

Appliance merchandising does not occupy a very prominent place in connection with the Vancouver Electrical

Association. A very satisfactory plan does exist whereby the central station will provide ranges for display in contractors' shops and a satisfactory arrangement in regard to commissions is also worked out between the central station and the members of the association in connection with appliances which may be sold by the contractors. However, the general feeling among the membership has been that the day of the small electric appliance dealer is past and that there is today a distinct and separate place for the electrical appliance shop and for the electrical contractor, and that the two, while having much in common, are really allies rather than competitors in the same field. As a result of the spread of this belief, the firms which are engaged in electrical appliance merchandising to a very large extent have discontinued any attempt to engage in the installation or contracting business, while the contractors in turn are abandoning their small appliance showrooms in the majority of cases and instead are handling installation work for the exclusive appliance establishments. In view of this situation, it was recommended to the annual meeting that the merchandising plan committee of the association should be discontinued.

Responsibility for the guidance of the association has been well distributed among the members during the life of the association. Committees and officers rotate each year, distributing the load of work and enlarging the experience of the members. The present officers are: T. C. Simmons, president; C. B. Jarvis, vice president; S. F. Ricketts, secretary; H. J. Sayer, treasurer; and an executive consisting of R. Hall, J. Homersham, E. Dunsmuir, G. W. Firth, R. Wallace, R. A. Graham, A. W. Hunter, W. M. Mott of New Westminster, and E. Hammersmark, of North Vancouver. Editor of "The Electric Eye" is G. W. Firth, and H. J. Sayer is its business manager. The association attributes to J. C. Reston, its former secretary, the long and hard work of developing and perfecting most of the accounting detail for the handling of the utility business. Miss Evelyn Ackroyd, formerly secretary for Mr. Reston in his own business, was taken from him and placed in charge of the association office when it opened its own headquarters.

If proof of the pudding is to be found in the eating, the relationship between the Vancouver Electrical Association and the B. C. Electric Railway Co. is proof that cooperation can be made to work where it profits both parties on a common sense and mutually responsible basis.



A quotation service published by the association and imprinted with each wholesaler's name for distribution by the latter

Electrical Improvement Drive Under Way in B. C.

Newly established committees are carrying forward a vigorous program of electrical improvement in 1937-38 for the Electrical Service League of British Columbia. Education, promotion and cooperation are to be featured.

Offered through the league's central station is an exceptional library of sound films together with projecting equipment. Throughout the lower B.C. mainland, J. Priestman is directing the planning of cooking schools, rural exhibitions, industrial promotions, and general education work.

The new committee organization is dealing particularly in these fields: range wiring and rewiring for old homes; adequate lighting; problems relating to lamps, as voltage regulation; problems in retail electrical stores; street and highway lighting; and codes, finance and membership.

Labor Arbitration Clause Urged in Agreements

To confine to an industry the disputes arising within it on labor matters and to secure an impartial judge for the settlement of such disputes, an addition to the typical arbitration clauses in labor agreements is being used by Walter J. Walsh, attorney in San Francisco.

The typical arbitration clause in a labor agreement sets forth that in event of questions or disputes which cannot be adjusted between representatives of the employer and the union, such disputes shall be referred to an arbitration committee. Two other clauses are added. The first sets up the arbitration committee to consist of two members chosen by the union, two by the management, and a fifth, a qualified electrical engineer, who is a registered member of the American Institute of Electrical Engineers, and in independent practice. The third clause provides that this fifth member shall be chosen by means of placing the names of such men in a hat and drawing the names arbitrarily. Each side has the option of objecting to any two names thus drawn. If no objection is entered, the first name drawn without objection will become the fifth member of the arbitration panel. Any expense involved for the fifth member of the committee is to be borne equally by the employer and the union.

Such agreements usually provide that no strikes or lockouts will be held pending adjustment of any difficulty.

The way in which the range installation costs were broken down after the first year's operation so that schedules might be revised based on actual costs

VANCOUVER ELECTRICAL ASSOCIATION

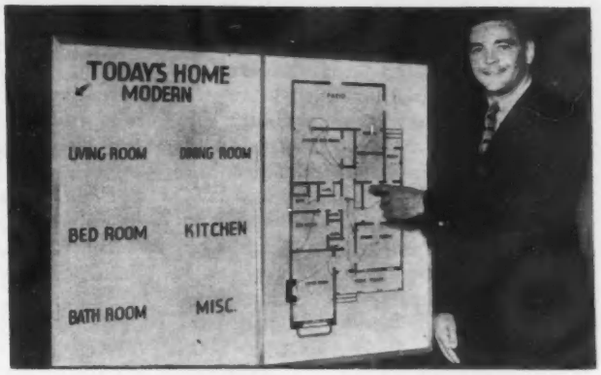
DETAIL OF COSTS ETCETERA IN CONNECTION WITH INSTALLATION OF ELECTRICAL RANGES

	RANGES INSTALLED	RANGES EXPIRATION	RANGES NOT EXPIRATION	PERCENTAGE EXPIRATION	PERCENTAGE NOT EXPIRATION	SELLING PRICE EACH	AVERAGE PROFIT COST MATERIAL EACH	AVERAGE PROFIT COST LABOUR EACH	AVERAGE PROFIT COST PERMIT AND CARTAGE EACH	TOTAL AVERAGE PROFIT COST EACH	AVERAGE AMOUNT AVAILABLE FOR EXPENSES AND PROFIT	AVERAGE PERCENTAGE OF PROFIT TO SELLING PRICE	AVERAGE PERCENTAGE OF EXPENSES AND PROFIT TO SELLING PRICE	TOTAL SELLING PRICE	INCIDENTAL EXPENSES TOTAL SELLING PRICE	INCIDENTAL EXPENSES TOTAL PROFIT COST	TOTAL PROFIT COST MATERIAL	TOTAL PROFIT COST LABOUR	TOTAL PROFIT COST PERMITS AND CARTAGE	TOTAL PROFIT COST PERMITS & CARTAGE	TOTAL AMOUNT AVAILABLE FOR EXPENSES AND PROFIT	AVERAGE PROFIT COST OF MATERIALS EACH AS TAKEN FROM BOOKS	AVERAGE PROFIT COST OF LABOUR EACH AS TAKEN FROM BOOKS	AVERAGE PROFIT COST OF PERMITS AND CARTAGE EACH AS TAKEN FROM BOOKS	AVERAGE PROFIT COST OF MATERIALS EACH AS BEFORE	AVERAGE PROFIT COST OF LABOUR EACH AS BEFORE	AVERAGE PROFIT COST OF PERMITS AND CARTAGE EACH AS BEFORE	SUGGESTED MARGIN OF TOTAL PROFIT COST EACH	SUGGESTED MARGIN % ON PROFIT COST OF SELLING PRICE	SUGGESTED MARGIN OF PROFIT COST TO B.C.E.R. ON THIS ITEM	TOTAL SELLING PRICE SUGGESTED TO TENANTS
1. RANGES SHORT SCHEDULE	16	07	9	56.25%	43.75%	$62.50	$21.56	$ 0.00	$ 2.04	$20.46	$ 4.04	7.13%	7.13%	$201.20	$42.70	$33.20	$135.34	$20.46	$32.32	$ 0.00	$ 2.01	$ 45.25	15.04%	$ 6.06	$ 54.20	$ 248.40
2. RANGES SHORT SCHEDULE AND WATER HEATER	28	21	7	01.67%	18.33%	$72.00	$21.03	$ 1.06	$ 2.25	$ 23.34	$ 4.04	5.62%	10.13%	$ 262.20	$ 52.44	$ 26.24	$ 183.52	$ 23.34	$ 37.87	$ 2.03	$ 1.04	$ 61.24	15.04%	$ 10.21	$ 81.85	$ 307.28
3. RANGES LONG SCHEDULE	35	27	8	84.38%	15.62%	$ 82.00	$ 30.60	$ 1.25	$ 2.32	$ 32.25	$ 3.04	7.08%	7.58%	$ 345.00	$ 34.16	$ 29.75	$ 282.04	$ 32.85	$ 29.15	$ 2.32	$ 1.25	$ 62.57	15.04%	$ 10.41	$ 83.42	$ 428.26
4. RANGES LONG SCHEDULE AND WATER HEATER	10	10	0	100.00%	0.00%	$ 97.00	$ 34.10	$ 34.27	$ 2.00	$ 31.35	$ 2.65	8.21%	11.00%	$ 323.00	$ 34.60	$ 32.04	$ 254.36	$ 31.35	$ 30.33	$ 2.58	$ 1.37	$ 64.37	15.04%	$ 10.71	$ 85.81	$ 408.36
5. RANGES SHORT SCHEDULE AND T-RS	3	2	1	66.67%	33.33%	$ 80.00	$ 23.10	$ 1.00	$ 2.20	$ 26.30	$ 4.00	6.25%	8.97%	$ 113.00	$ 22.50	$ 9.00	$ 81.50	$ 26.30	$ 32.00	$ 2.20	$ 1.20	$ 61.55	15.04%	$ 12.21	$ 73.86	$ 147.36
	104	143	24	87.13%	12.81%	$ 93.33	$ 25.76	$ 11.40	$ 2.20	$ 23.47	$ 2.65	6.13%	8.87%	$ 276.70	$ 39.62	$ 25.11	$ 220.36	$ 24.29	$ 23.33	$ 26.80	$ 13.42	$ 2.46	$ 40.62	15.04%	$ 9.00	$ 79.23	$ 312.98

Everything was going fine then

Somebody Tripped

By WALTER L. STICKEL
Department of Adequate Wiring Design,
Electrical Development League of Southern California



Author Stickel and the celo-glass box

DO you remember the story of the man who roamed the world looking for the pot of gold at the end of the rainbow, only to come to the end of the trail right in his own back yard? If you do you'll have a pretty clear picture of what's been happening in the electrical industry during the past several months.

Along about 1932 America suddenly awoke to the fact that she was going electric in no uncertain terms. She acknowledged that "electricity is no longer a luxury, it is a definite necessity. It lights our homes, our places of work, our streets; it turns the wheels of our transportation and our factories." She saw her electrical industry respond with the greatest manufacturing and selling activity it had ever attempted. Sales of electric appliances doubled. New items such as electric razors, comforters, tea tables, etc., made their appearance on the market and in the home. Here and there, that new creation, the all-electric home, took its place in the residential community.

During this unprecedented electric boom, leaders of the electrical industry in the Pacific Southwest were quick to recognize the new day. They constructed in their area the hydro-electric power project, Boulder Dam. They built a 270-mi. transmission line to carry its energy into Los Angeles. They went into the factory, the office, the farm and the home with this new message of power. They saw the oneness of their end and united into a league. They called it The Electrical Development League of Southern California. They patterned a slogan fitting to their ideal: "California's Electrical Age Has Just Begun." The league stood as the industry's challenge to interruption, not so much for what it was, but rather for what it represented—a united front—a coordinated effort. They celebrated their new age with a gigantic parade and exposition. Southern California's electrical age had arrived.

A beautiful picture, and the electrical industry started chasing rainbows. The utilities lowered their rates, manufacturers increased their volume and dropped their prices. Architects and builders investigated the new opportunity in this all-electric idea.

Then somebody went home and tripped over a wire. A small detail, that, yet it served to awaken an industry to attention. This somebody received a pretty good bump. It took a pretty good bump to show him that that little piece of wire constituted a real bottleneck to the future growth of the electrical age. It shocked the industry into the realization that homes were wired for 1917 equipment.

Balance 34 Against 250

Chart 1 is illustrative of the seriousness of the condition which the electrical industry faces. You will note that there has been a 250 per cent growth in the use of electric appliances throughout the last ten years. During this same period wiring adequacy increased but 34 per cent*. In other words, little "34" is trying to balance the scale against big "250." Naturally enough, it just can't be done, so the electrical industry has united to break the bottleneck.

The Adequate Wiring Campaign is nation-wide in scope. In southern California it will be carried on by the Electrical Development League. The league will act as a neutral unit in behalf of all branches of the industry. It will carry the story of adequate wiring first to the industry to insure a united front, then the general public. This will be done through talks before contractor, wholesaler, manufacturer, distributor, utility and dealer organizations plus service and civic clubs.

Chasing rainbows and failure to see the barn door were not the only reasons for the development of this bottleneck condition. Lack of wire selling to the public, lack of dissemination of intra-industry information, price cutting—all contributed to this temporary success of the bottleneck.

The "wire selling story," it is hoped, will soon be in the sales kit of every member of the industry from the appliance man to the electrician. By use of factual data it may be clearly proved to the architect, the contractor, the home builder that wiring is the most important part of the modern home and must be adequate. With equal facility it may be pointed out that this wiring adequacy will not necessitate additional expense of any consequence.

Consider, for example, Chart 2. Here is shown the construction cost of the average six-room Southern California home. The costs at the left are for adequate gas equipment. These figures are not figments from some one's imagination but are taken from quotations made by members of the gas industry. For example, heating estimates were made by gas heating specialists, plumbing costs by plumbers, etc. The total expense for "gasifying" this six room home and equipping it with a minimum of forty-five electric outlets is $650. The right side of the chart shows the cost for this same home with all electric equipment. The total, $685, includes an adequate wiring arrangement consisting of sixty-five outlets. This means that $25 will give the builder or owner a thoroughbred, all-electric home.

Here is a story in itself designed to sell adequate wiring, but particularly beneficial to electric appliance merchandisers. A brief survey of southern California builders proved that few if any of them realized the ease, financially, with which a home might be made adequate electrically.

The wiring story should also stress the added comfort and convenience features of the adequately wired home. The celo-glass display carries this type of appeal. Here are embodied two presentations on one unit. The board

* These figures were obtained as a result of a survey of five hundred Los Angeles homes conducted by the Bureau of Power & Light.

is so constructed that through the use of light it will show both the inadequate and adequate wiring diagrams. Illuminated simultaneously are the added features available with the adequately wired home. It stresses the fact that only electricity is modern and can be expected to be modern in 1957. These comforts and conveniences of electricity are most important. They have a tremendous appeal to every class of home builder. If properly explained from this angle, adequate wiring will be as much in demand as is the tiled bathroom.

Know Your Industry

The next obstacle to be removed is the lack of information regarding industry activity which exists among its members. It is true that in the electrical group the right hand seldom knows what the left is doing. The utilities, manufacturers, wholesalers, distributors, dealers, wiring contractors all seem too busily engaged in their own activity to find out just what each of the others might be doing.

It so happens that adequate wiring is an industry problem and should be treated as such. No one of the components of the industry can do the job alone. It necessitates coordinated activity. This means that each group must be kept informed of just what goes on in the other associated fields of endeavor. For example, the electrical contractor should be made conversant with electric rates, appliance costs and operation expense. He should have some merchandising knowledge so that he can spread the all-electric idea among his contacts. Conversely, the utility and merchandising men should have an understanding and proper appreciation of the wiring job so that they may carry the message of adequate wiring into the homes of their appliance prospects and customers.

In southern California the league is undertaking the dissemination of industry information in an effort to secure this needed unity of action. It's a simple thing to help the other fellow tell his story, yet it's sure to reap big dividends.

Finally, there's the "price cutting" handicap. Selling down rather than selling up has long offered the path of least resistance to those interested in wiring. The "get the job at any cost" method of business has hurt the contractor, the public and the industry as a whole.

Much has already been done to correct this evil. Contractors organizations, of which there are several in southern California, have sprung up to curb price cutting. Manufacturers, wholesalers and dealers are working as never before to maintain a set standard of prices for their products.

More for Electricity

However, the job has not been completed. It will be one of the ends of the adequate wiring program to slice a little larger share of the building dollar for the electric industry. The two "pie" charts are indicative of what is meant.

Chart 3 shows how the building dollar is divided today; Chart 4, how it should be divided. Wiring takes about two per cent, or two cents of every dollar. The bigger slice will be obtained by going electric or selling up. It will come from the portion now set aside for industries intent on making the home adequate for gas. This ten per cent will be sufficient to electrify the average home completely, providing for adequate wiring and illuminating.

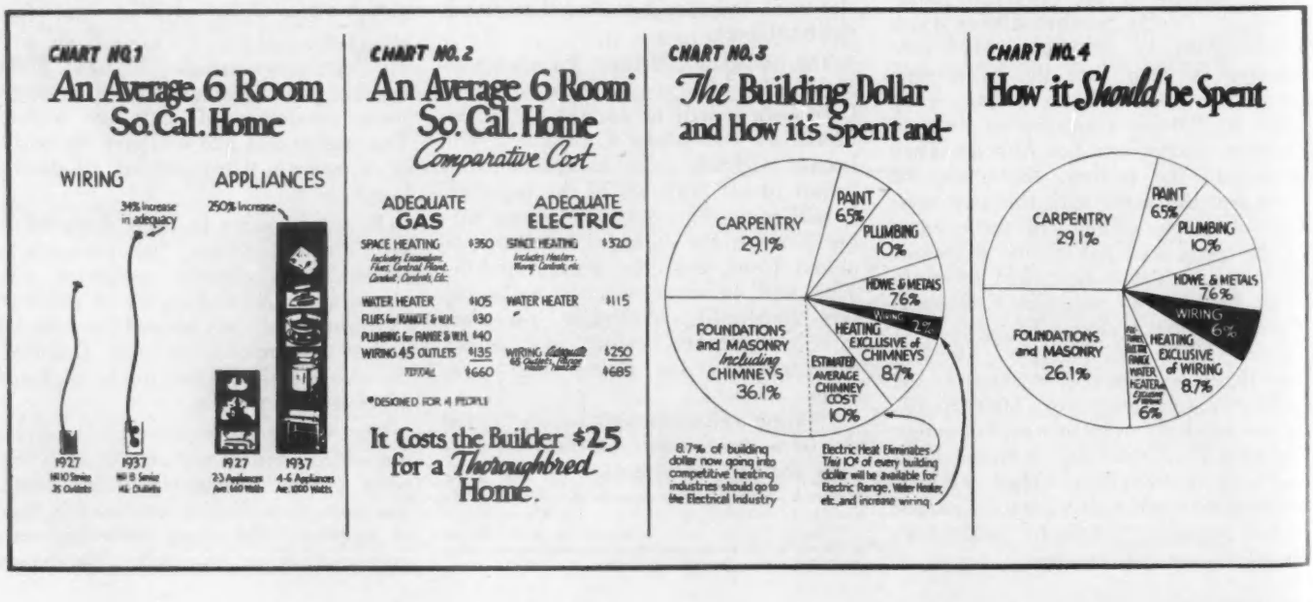
The nice part about an adequate wiring program is that everyone benefits. For proof, consider the results of a survey recently made in its Santa Ana territory by Southern California Edison Co. There the Edison company found that of 70 adequately wired homes, 64 were using electric ranges; 56, water heaters, and 33, all-electric heating.

So the wiring man profits immediately by selling a larger job, more copper capacity and a greater number of outlets. The wholesalers are quick to feel the results by larger orders from the wiring contractors and a greater demand for fixtures. The manufacturers, distributors and dealers receive their benefit through an increased demand for appliances. And finally, though at a somewhat later date, the utilities realize a profit because increased wiring means increased load.

Public Benefits Most

To the public, however, goes the greatest benefit of all. In the first place, the owner of the all-electric home realizes an actual monetary profit over a short period of years. Savings accruing from long-lived electric appliances and from fewer cleaning and redecorating bills amount to a sizable figure. Again, by starting with an adequately wired home, future alteration expense can be completely eliminated. Another factor frequently overlooked is the voltage loss which occurs when undersized wire of insufficient copper capacity is used. Voltage loss unfortunately doesn't change the electric meter so the consumer pays for the electricity whether he actually uses it or not.

But comfort and convenience are the two advantages the public will appreciate most. When John Doe has enjoyed the cleanliness, safety, health and modernity that only an all-electric home can bring, he will thank some one in the electrical industry for selling him on the idea.



Electra's Husband

Talks Taxes

ELECTRA and I had just rolled off the first 120 miles of our vacation trip when we decided to get some gas. When we pulled out of the service station to look for a lunch room Electra remarked, "That's the first time I ever noticed such a sign on a gas pump. It said, 'Gas—15c—State tax—3c—Federal tax—1c.' Is that a new wrinkle?"

"In strange places we observe things that we don't notice at home," I replied. "You will see that sign at most places where we buy gas. By the time we get back from this little jaunt we probably will have used 150 gallons on which we will pay a total of $6 in taxes. That would buy three shirts of the kind I'm wearing today."

"I've been wondering why you never seem to have enough shirts," Electra said. "So it's the gas tax that's got you down,"

"Let's get lunch first," I suggested.

After lunch, with a 5c sales tax, and a pack of cigarettes, with a 6c Federal tax, we bought a magazine with a 1c tax and resumed our journey.

"As I intimated, I don't like taxes," I explained, "but the thing that really gets me down is the tax dodgers who make me pay part of their just share."

"You mean those fellows they've had on the carpet down in Washington?" she asked.

"No, I don't mean them. All the taxes they may have avoided wouldn't make a dent in the general situation. That investigation is just a smoke screen. The worst offenders are the states and cities which allow a man to own all kinds of bonds without paying a cent of tax on them. I suppose there are 50 billion dollars worth of them in safety deposit boxes all over the country. That's where the big boys do their real dodging and they do it with the complete approval of Uncle Sam.

"See that car ahead of us with the "E" license plate? County property—no tax. See that schoolhouse over there? Public property—no tax. When we come to the next town notice the postoffice, the city hall and the library—all beautiful buildings on the best real estate. Public property—no tax.

"That isn't so bad in a way, because you can argue that if the city pays taxes on its own buildings it would only be paying to itself. What really gets me down and keeps me down is tax exemption on money-making operations."

"What do you mean by that?" Electra asked as we passed a "slow men at work" sign.

"I mean when government goes into business for the purpose of making money in competition with its own citizens. When we get to Palo Alto you can see an electric system which is owned and operated by the city—for profit. Yet it pays no taxes, while all around are other towns that get their electricity from a company which gives over 15c of every dollar it takes in—for taxes. And the rates are just the same. Who gets stuck in that case?

"We'll get an even better illustration in San Francisco. The green cars are operated by a private company which pays plenty of taxes. On the same street are gray cars, operated by the city with complete tax exemption. Both charge a 5c fare. Again I ask, who holds the bag?"

"I don't see that it makes any difference," Electra said, "just so long as the fare is the same."

"Who do you suppose makes up the million dollars, or whatever it is, that the gray cars should pay in taxes—and don't?"

"Oh, I see what you mean! The people who own the green cars."

"Yes. And also you and I who go to San Francisco only two or three times a year and never ride the street cars, because the taxes from the green cars go to support state institutions, schools, prisons and other things which take our own tax money. Because the gray cars, the municipal electric plants and the irrigation districts and the water works all over the state pay no taxes and we have to contribute more than our share. You don't hear anything about that when a big roar is raised about tax dodging. And that isn't all."

"Goodness, it's hot out here on this open road!" Electra interpolated. "Aren't you warm?"

"I get warm any place where the conversation turns to taxes. What we have been talking about is mere chicken feed to the real tax dodging that goes on in Washington in the name of conservation, reclamation and protecting the peepul from the exploiters. When they get through with their seven TVA's, the Florida ship canal, the Mississippi barge line, Passamaquoddy, Fort Peck, Bonneville, Grand Coulee, and the Porto Rico Rum Distillery, you'll have tax dodging *de luxe*.

"So now you see why I argued against getting a new rug last spring, because it was tax time—second installment of city and county taxes, Federal income tax and State income tax not to mention the incidental taxes we pay whenever we breathe. So, to make a long story abrupt, we paid the taxes and some young squirt of a government department head got the rug. *O tempore, O mores.*"

"*Nux vomica*, I would say," Electra retorted. "Let's stop here and get a coke."

This conversation with occasional interruptions lasted for about an hour, during which brief span Electra and I and the rest of us in this free and independent nation accrued a tax obligation of $1,370,000.

All of which brings to mind a clever introduction to the subject of taxation and the public utilities used by one of the participants in a P.C.E.A. speaking contest some years ago.

He related that Faraday was making an electrical demonstration in the presence of Gladstone.

"Very interesting," the prime minister remarked, "but of what possible value is it?"

"My dear sir." said Faraday, "some day you may be able to tax it."

AFTER many years of playing the games of "white horse" in the daytime and "cat" at night while driving on our vacation, Electra and I found a substitute which progress now promises to spoil. You've probably played these games—the first one who sees a white horse and announces the fact in those words collects a nickel; a white mule counts as five white horses and a white cow mistaken for a horse calls for a nickel forfeit. Cat's eyes and tin cans caught in the headlight beams took the place of horses and cows at night.

Well, traveling the main highways and byways, most of which are paralleled by rural lines here in the West, we took to counting three-wire services to farm homes. While this might not constitute absolute proof, we assumed that it meant an electric range and perhaps a water heater in the kitchen. So we called out "electric home" instead of "white horse."

Now on this last trip what did we find? A lot of utilities changing over to service entrance cable. So our new game falls before the tide of progress. Perhaps someone can suggest a substitute.

EDITORIAL

Rates and Inflation

WHAT will happen to electric rates in the case of inflationary developments which might cut the purchasing power of the dollar to one-half or one-third of its present value? The natural answer to this question is that they would increase. But can they? In the face of political propaganda, yardsticks and other such obstacles, it is highly debatable whether the public would countenance any increases, even though regulatory bodies might find them reasonable and just.

Possibility of inflation is engaging some rate making engineers and regulatory commissions with the study of possible hedging clauses which would afford some measure of relief. One proposal which would apply to power users whose rates are now extremely low includes clauses incorporating credits and charges based upon fluctuations in the price of fuel, a similar provision covering additional direct taxes and finally a clause tieing the rate to the purchasing power of the dollar as interpreted by the U.S. Department of Labor "All Commodities Price Index."

Whether the country will see additional inflation or not, there is cause for concern over the narrowing margin between gross revenues and operating costs. The operating ratio for any new business is increasing to a point where the margin is in some cases non-existent. The remedy appears to lie in the direction of rate clauses which will automatically compensate for rising costs, coupled with selective selling which will insure those types and classes of load that carry a margin of profit.

Economics or Subsidy?

HERE in the Far West the electrical industry can feel a reasonable degree of pride for its accomplishment in rural electrification. Particularly in Utah, Idaho, Washington, Oregon and California has noteworthy progress been made in taking electric service to the farmer. Experience in these states goes back two and three decades. It includes all of the trials and tribulations of any pioneering effort. Before the present high state of electrified farm saturation was reached, there was much experiment; many difficulties had to be overcome.

Today with all of the national hue and cry for rural electrification, the sponsors of this desirable service might well study the situation here on the Pacific Coast. Such study would reveal certain fundamental principles which those familiar with conditions know must be given consideration if rural electrification is to be on an enduring basis. At present in some sections of the country, these principles are being ignored and disastrous results are certain.

What these principles are and just how vital is their application are told in this issue by S. S. Bloom of the California Railroad Commission's engineering staff. It is obvious from his discussion of the development of rural electrification in California that when sound economics, intelligent engineering and respect for the rights of existing consumers are ignored then trouble looms in the future. Primarily rural electrification is a matter of rates and investment. If the rates which are to apply fail to return sufficient revenues to carry all of the costs of providing the service, including necessary charges on the investment, then some other theory than sound economics is being used. Someone must pay. If the rural consumer does not, then other consumers on the system (if the rural line is a part of an operating utility) provide a subsidy. In the case of REA projects it appears that the subsidy will come ultimately from the taxpayer.

Put the Cart Behind the Horse

"DO YOU want to know one logical step which would do more to promote adequate wiring than any other?" The speaker was a nationally known figure who is perhaps more intimately familiar with the commercial phases of the industry than any other man. "Let the contractors, wholesalers and utilities call on the manufacturers in a body and insist that they stop making No. 14 rubber-covered wire and concentrate their production on No. 12."

To those who have felt that in approaching the adequate wiring problem with a campaign aimed at the public, the industry was getting the cart before the horse, this suggestion sounds sensible. There is still some internal housecleaning to be done. Much of the present trouble with wiring installations comes from inadequate circuit capacity—too much No. 14 wire. If wiring can be compared to lighting, this suggestion is not so far fetched. What happened to the 40-watt lamp? One guess is that 50 and 60-watt globes were substituted for it in lamp manufacturers' production schedules at the definite request of someone. Let the same kind of appeal be made to the wire manufacturers. No. 14 r.c. has long been an industry

football—subject to all kinds of price vicissitudes with no one making any profit. Certainly the small increase in price which the consumer would have to pay for No. 12 would not be enough to jeopardize a wiring contract.

There is one other internal phase of adequate wiring that would have a salutary effect. This is standardization — not of materials, for that is well in hand — but of wiring methods. Instead of a dozen or more wiring methods, why can't there just be two? Certainly with some agreement on this subject, there would be some opportunity for securing the reduced costs toward which the power companies have been working.

The forthcoming Los Angeles convention of the National Electrical Contractors' Association could do a lot worse than consider these two topics. Adequate wiring will have an important place on the program. So will representatives from every branch of the industry. Here would be an ideal place for picking flaws in these two suggestions and for initiating some action.

Uncle Learns About Business

WHEN your Uncle Sam goes into business he wants no such interference with his plans as he imposes upon his predecessors in that business venture. Those forgotten men who wrote the constitution with a memory still fresh of the escape from autocratic rule which present generations have never themselves had to live under, anticipated that if their new government ever went into business it might be more tyrannical than any business established under its law. They set up as many safeguards for the people as they knew how to devise. That their fears were not imaginary is given proof by many events during the past months—months which have seen government in business on a scale and variety of projects never before equalled in our national history.

It is amusing too, to the business man who has to go through so much of the same kind of trouble without a bit of sympathy or aid to see what Uncle Sam does when faced with some of the irritations that come with business.

Since labor troubles seem to predominate today, take a look at Uncle Sam in his own labor policy. Asked whether government employees may unionize and bargain collectively, President Roosevelt smiled broadly and said they might unionize, but as to bargaining collectively, Uncle Sam didn't do that sort of thing. And as for striking, that would be little short of treason.

Proof of the pudding came shortly afterward when the *Algic* struck in sympathy with a strike of Uruguayan longshoremen. The *S. S. Algic* is owned by the U. S. government and its crew is paid from government funds. In response to request for instructions, the captain was cabled to "warn crew that all still refusing to perform duty will be placed in irons and prosecuted to full extent of law on return to United States. If they still refuse, place ringleaders in irons. If other crew members still refuse duty, have them removed from ship and replace them with American, if available, and if not, foreign seamen." So Uncle can't take it?

Another incident closer to home would do credit to Tom Girdler, that tough economic steel royalist who defied the C. I. O. The C. I. O. pulled a jurisdictional strike in the Metropolitan Water District tunnels in southern California. But General Manager F. E. Weymouth of the district did what any other business executive probably would feel inclined to do—he virtually told the C. I. O. what Tom Girdler did. He added that you couldn't strike against a governmental project. When dynamite was found in attempted destruction of the pole line carrying power to the project, and several attempts to blow up the line had been made, there may have been something reminiscent of the incidents leading up to the Tom Mooney case in Northern California in the affair, but as long as the government is being sabotaged that's different.

Turning to other phases of Uncle in business, everyone whose name appears on the U. S. treasury's list of income tax payers has just received some rather elegant color printing in the form of advertising and promotion of U. S. savings bonds. One looked in vain for that paragraph denoting that the Security & Exchange Commission had passed on the responsibility of the maker, the truth of the advertised claims, or honest intentions as to what is to be done with the money, which has become necessary with private financing.

In view of the storm of suspicion, the extreme attempts to clamp more regulations on business, and other irritations caused by the so-called "consumer" champions who have sprung up like weeds under this new order of making every business look dishonest whether it is or not, it is also something of a relief to hear that one of the assistant directors of the Bureau of Foreign and Domestic Commerce made a speech in which he said, "I propose to defend the thesis that the cost of distributing commodities is not, generally speaking and contrary to popular belief, too high." Moreover he supported it by evidence—the very kind of evidence that has been ignored when coming from business itself in answer to some of the sad fierce thinkers' wails about gouging the consumer.

Yes, Uncle is in business. If the founding fathers of the country sought to save him from the headaches of business by keeping him the umpire rather than the base runner, he's in the game now. But he has his own set of rules. You can imagine how popular that makes him with all the rest of the kids.

Maintenance Engineers

Question

Can you give me a method to find the voltage error which results when a low resistance voltmeter is used on a high resistance circuit, such as on a radio power supply?

WHEN an electric current flows through a resistor there will be a voltage drop across the resistor. In other words voltage (electric pressure) will be used up in forcing the current through the resistors. The amount of voltage that is used in forcing a current through a resistor will depend on the size of the resistor, temperature and material, and the amount of current flowing through it. The exact amount of voltage drop across a resistance may be found by Ohm's Law.

Ohm's Law states that the voltage across a circuit will be equal to the current in amperes multiplied by the resistance in ohms. In other words: E equals I $\times$ R, where E equals voltage in volts, I equals current in amperes and R equals resistance in ohms.

If two resistors are hooked in series the total resistance will be greater but the current flowing through the circuit will be less.

Assume a power supply giving a voltage of 60 volts *with no load.* The internal resistance of this power supply is 2,000 ohms. This internal resistance is caused by the resistance in the secondary of the power transformer, the rectifier tube, filter chokes, etc. Now, to measure the voltage output of the power supply hook a voltmeter across the power supply. The different internal resistances depend upon the quality of the meter, but in all cases the resistance will be high. Assume two voltmeters, one with 10,000 ohms internal resistance and the other with 500,000 ohms internal resistance. If the first is connected across the power supply we will get a reading of 50 volts. If the 500,000-ohm voltmeter is connected across the power supply it will show a reading of 59.76 volts. This would seem to indicate an error somewhere.

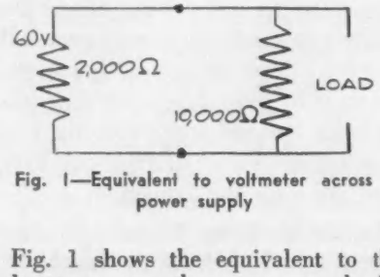


Fig. 1—Equivalent to voltmeter across power supply

Fig. 1 shows the equivalent to the voltmeter across the power supply indicating both by their respective resistances. As far as an external load is concerned, the voltmeter is connected in parallel with the line. However, in measuring the voltage there is no load except the voltmeter. It can be seen that the 2,000 ohms internal resistance of the power supply and the 10,000 ohms resistance of the voltmeter are effectively in series. In other words all the current flowing through the voltmeter will also have to flow through the power supply. Since these two resistances are in series, the total resistance will be 2,000 plus 10,000 or 12,000 ohms.

Using Ohm's Law, the amount of current that will flow through the voltmeter and the power supply will be:

$$I = \frac{E}{R} = \frac{60}{12{,}000} = .005 \text{ amp.}$$

In other words when using the 10,000-ohm voltmeter, .005 amp flowing through the meter and back through the power supply to the voltmeter. Using the 500,000-ohm voltmeter with the 2,000 ohms internal resistance of the power supply, there is a total resistance of 2,000 plus 500,000 or 502,000 ohms and, by substituting in the formula,

$$I = \frac{E}{R} = \frac{60}{502{,}000} = .00012 \text{ amp.}$$

With the 500,000-ohm voltmeter a current flows through the meter and power supply of .00012 amp., whereas it was .005 amp. with the 10,000-ohm voltmeter. It can be seen that there is a large difference in the current flow with the two meters.

As mentioned at first, when current flows through a resistor there will be a loss of voltage (voltage drop) across the resistor. This voltage loss can be found by Ohm's Law: E equals IR. Substituting to find the voltage loss across the power supply when using the 10,000-ohm meter: .005 (2000) equals 10 volts. In other words, 10 volts of the 60 will be used up in forcing the .005 amp. through the power supply.

Thus, 60 minus 10 or 50 volts are available to the load. For a check, figure out what the voltage drop across the meter would be: E equals I R equals .005 (10,000) equals 50 volts. Thus of the 60 volts, it takes 10 to force the current (.005) through the power supply itself and 50 volts to force the current through the meter.

Now take the case of the 500,000-ohm meter, where the current is .0012 amp. Now the voltage drop across the power supply is: .00012 (2,000) equals 0.24 volts. Thus, of the 60 volts, only 0.24 of a volt is used to drive the current through the power supply. The available voltage across the meter is 60 minus .24 or 59.76 volts. This is shown in Fig. 2.

Since the current is not .00012 but actually somewhere between .000119 and .00012, it checks out that there are 60 volts across the meter. There are very few voltmeters that can read as accurately as .24 of a volt at 60 volts so the small error may be disregarded unless laboratory precision is needed.

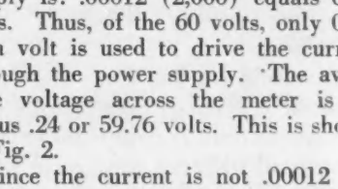


Fig. 2—Effect of voltmeter resistance on on reading

The "error", of course, is due to the very poor voltage regulation of the power supply. Even with a very small current of .005 amp. the voltage output of the supply drops down to 50 volts.

Actually, there is no "error" as far as the drop in voltage available to the load is concerned. If a load having 10,000 ohms is put across the supply there will only be 50 volts across the load and not 60. For any value of load resistance less than 10,000 ohms there will be more current which will cause the voltage drop across the supply itself to increase and lower the voltage across the load. Conversely, for loads of more than 10,000 ohms the current will be less and the voltage across the load will be more than 50 volts.

The correction factor in this case would be equal to the:

$$\frac{\text{Voltmeter resistance}}{\text{Voltmeter resistance plus internal resistance}}$$

equals .996.

Numerically:

$$\frac{500{,}000}{60 \times 500{,}000 + 2{,}000}$$

equals 59.76 volts

will be indicated by the 500,000-ohm voltmeter.

Sales Parade

NEWS, METHODS, IDEAS, PLANS, COOPERATIVE CAMPAIGNS, RESULTS AND EXPERIENCE IN THE SALE OF ELECTRICITY AND APPLIANCES

New Homes

Electrical Standard of Living Program Is Started

Inaugurated to encourage those who plan to build or modernize to take advantage of up-to-date knowledge and equipment, the "electrical standard of living" program, sponsored by electric service companies throughout the country, got under way late last month.

The program, suggested by General Electric Co. and supported by almost every utility in the West, carries with it local and national awards amounting to approximately $100,000.

Persons building or modernizing a home, work on which was begun after Feb. 1, 1937, and which will be completed some time between Aug. 15, 1937, and Oct. 31, 1938, will be invited to submit plans, specifications and photographs to their local sponsor. These will be judged and rated according to the way they best realize the ten specifications of good location and architecture, sound construction and skilled labor, quality materials and equipment, landscaping and interior decorating, sound financing, new materials, insulation and sound deadening, heating and air conditioning, plumbing and sanitation and electrification.

Awards for the best entries will be made by the sponsoring utility and by various manufacturers including G.E. All prizes will be given irrespective of the cost or size of house entered.

The second phase of the program continuing from Sept. 27 to Dec. 4, is educational in nature and pointed at those who have no immediate construction or modernization in mind. It is also sponsored by local utilities. Participants are furnished with informative material detailing the advantages of complete home electrification, including kitchen treatment, scientific lighting, planned home wiring, heating and air conditioning, and asked to describe briefly why electrical living appeals to them.

Those in charge of the program in the West are: E. W. Brown of Salt Lake City, covering Utah, Montana, Wyoming, New Mexico and Colorado; R. M. Loughrey of Portland, covering Oregon, Washington and Idaho, and George West of San Francisco, covering California, Arizona and Nevada. All three men are G.E. representatives.

When the Shanghai Power Co. requested Westinghouse Electric & Mfg. Co. to manufacture small electric ranges especially adapted to the Oriental mode of living it was thinking of the market which might be tapped in China and Japan. However, an equally large if not larger market remains to be tapped in the Oriental sections of America's large cities. Shown above is a Japanese cooker equipped with a 1200-watt Corox element, 1500-watt rice bowl, 1600-watt grill compartment and 600-watt appliance receptacle. Below is a Chinese cooker, complete with built-in rice pan, frying bowl and one 1200-watt Corox element

CELEBRATING ITS 25TH year of existence as a company, Utah Power & Light is conducting as its silver anniversary campaign an intensive sales drive on electric ranges and water heaters. Started Sept. 25 and ending Dec. 25, the campaign offers prizes of silverware to salesmen, superintendents, etc., exceeding their quotas. Except in Green River and Evanston, Wyo., where each salesman is expected to sell five ranges and one water heater, salesmen quotas are are ten ranges per man, three water heaters.

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WITH THE INSTALLATION of a complete Westinghouse electric kitchen by the Greater Broadway Furniture Co., the Architects Building in Los Angeles, Mecca for new home builders in search of ideas, now has three electric kitchens for display to the public.

Restaurants

Cooking Council Starts Commercial Sales Drive

In order to take advantage of the potential market offered national distributors and local retailers of commercial electric cooking equipment by the 60,000 first-class restaurants and 34,000 lunch counter-equipped drug stores in the United States, the newly formed National Commercial Cooking Council last month issued a plan book outlining a cooperative promotional and sales campaign toward the electrical modernization of such establishments.

Commenting on the campaign, C. E. Greenwood, commercial director of Edison Electric Institute and member of the council says: "The special market for this division of electrical merchandise is there for those who cultivate it. Acceptance is established. Volume is beginning to climb. A complete market analysis is presented in the plan book. Dealer aids and excellent promotional material are described; every type of participation is outlined comprehensively. A sweeping response is indicated."

The council, formed jointly by the commercial division of Edison Electric Institute and the food service equipment section of the National Electrical Manufacturers Assn., is headed by P. M. Alden of the Philadelphia Electric Co.

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Marketing Research Report Expanded in Eight States

Coincident with the setting up of an installment credit unit in the Marketing Research division of the Bureau of Foreign and Domestic Commerce under the supervision of M. L. Merriam, formerly connected with the Bank of America, Dr. Wilford L. White, head of the division, has announced that the division's reporting service in the retail field will be expanded to cover eight western states. States already covered include Wyoming, Colorado and New Mexico.

At the same time the retail and wholesale sections of the organization have been combined to form the Distribution Costs section; industrial marketing has been taken out of the wholesale trade section and made an independent unit, and the construction section has been transferred to the economic division.

Continual Enlargement Follows "Plugging" of Holland's Shop

HOLLAND Electric Shop, owned by John Holland, in Highland Park, Los Angeles suburban area, has just been modernized and enlarged for the fourth or fifth time and today it is by all odds one of the best looking electric shops in any suburban area in southern California. It is electric and nothing else.

The new front is a 50-footer on N. Figueroa Street, and the complete depth 110 feet. Partitions have been removed and merchandise display dropped below eye level so that a good view of the entire floor may be obtained from any point; walls and ceilings have been tinted in light colors, new lighting fixtures have been installed to give better diffusion of light, the windows have been treated to a line of flood lights that give a brilliant appearance to the store when viewed from the sidewalk; the offices have been taken to the rear and ensconced behind low, artistic, knotty pine partitions that do not interfere with vision. Back of the model all-electric kitchen at the rear, is one of the neatest and best lighted radio service rooms in the city of Los Angeles and back of that with entry space for three automobiles at a time is the automobile radio installation and servicing room.

When asked how such a shop with only a neighborhood appeal could be built up Mr. Holland has one word and that is "plugging".

"We have found nothing gained by sensational methods, and gaudy sales ideas, frequently presented and at one time occasionally tried, got us nowhere," says Mr. Holland, "so for years now we have just consistently plugged.

"We have gone the limit on service in all lines and without complaint even when too much was asked. We have kept on the street as salesmen and as repair men only men who can take their places in local society, maintain homes and take a normal interest in community affairs.

"I have myself kept busy at things outside of my business. I am now president of the Chamber of Commerce, am past president of the Southern California Electrical Dealers' Association and am a director of Electric Development League. I have tried to take an interest in schools, luncheon clubs, fraternal orders and all that goes into community development.

"Once a month the store is completely changed around and merchandise shifted so that it looks like a different store. Windows are changed practically every week.

"Every customer with few exceptions becomes a friend of the store and also a friend of the salesman who calls on him. I note that we have sold the eighth radio to a large number of people and the third washing machine to scores of them.

"We advertise consistently in the local newspaper but always in a fairly conservative way. We have as many leads as our outside men possibly can follow up and we refuse to increase the number of salesmen to the point where life becomes hard for them and where they have to work night and day to make a living. *We get more sales per man by far* by giving them time to make great circles of friends. Our men today seldom if ever have to go to a home where they are not welcomed warmly and they discuss replacement of a washing machine or radio always from the standpoint of the customer,—will it pay in terms of greater enjoyment and in reduced costs? That is the story and the whole story, and I feel it is the best kind of a story. If electrical appliance dealers everywhere would try to build themselves up as figures in a community and their stores and shops as community assets and keep salesmen who fit in and take useful parts on respectable incomes, I am satisfied that profits all around would be greater."

Sales Drives Feature Idaho Power's Fall Season

Idaho Power Co. employees last month tightened their belts and went into action on three selling fronts. Major sales activity was centered about electric ranges and water heaters, aim being to bring the year's total sales to more than 4,000 ranges, 2,000 heaters. At the same time the annual "Mazda-ho" sales campaign on light globes and the "Modern Aladdin" 1937 I.E.S. lamp campaign were progressing smoothly.

Quota set for the "Mazda-ho" campaign is 5,000,000 watts by Oct. 27. Although no quota was set for the I.E.S. campaign, closing at Christmas, efforts were concentrated in this direction.

A one-week salesmanship training school for all home service girls connected with the drive was conducted by the company during the last week of August. This was concluded by a dinner meeting at which the campaign was outlined. Speakers at the affair were Walter Potter, Portland, northwest representative of the General Electric Co.'s incandescent lamp division; R. E. Nilson, Salt Lake City, Colonial Premier representative; William Hopper, Boise, Gem State Electric Co., and R. E. English, Portland, Miller Lamp Co.

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NORTHWESTERN ELECTRIC Co. quit the sale of table cookery and other small appliances in its offices in the Public Service Bldg., Portland, the first of the month. Reasons given for the move were the sales work done by electrical dealers in the territory served, the increasing number of electrical dealers handling small appliances and the general availability of reputable merchandise in every community.

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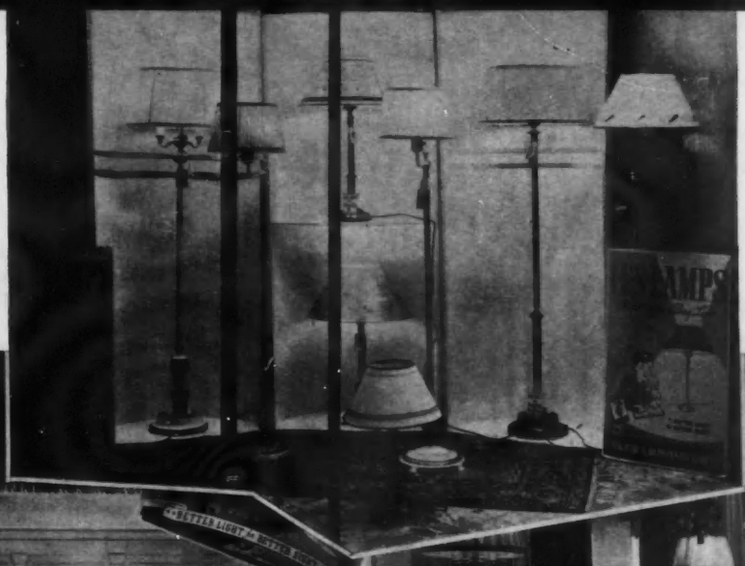
DEACONESS HOSPITAL, Spokane, has installed three 18-kw. heavy duty ranges and a 14-kw. bake oven in a remodeled kitchen to handle cooking requirements for 900 persons.

Recently remodeled Holland Electric Shop, Long Beach

I.E.S. Prize Winners

Among the winners in Puget Sound P. & L. Co. window contest last year were Electric Supply Co., Wenatchee; Thiel & Welter, Bellingham, and Rumbaugh Dept. Store, Everett, Wash.



Light Conditioning

is the title given to the I.E.S. lamp campaigns this fall, just beginning among many utilities and dealers. These windows show three effective methods of tie-in window display, with and without home atmosphere

Building Contractors Told Adequate Wiring Story

Direct to the most vitally important factor in the building game—the home-building contractor—Pacific Gas and Electric Co., San Jose division, carried a message of the necessity for adequate wiring to provide comfort and conveniences to the ultimate owners of the homes being built. For two unique meetings, one in San Jose—the other in San Mateo, invitations were sent to all building contractors to attend a dinner. There were 33 contractors in attendance at the San Jose dinner, 25 at that in San Mateo. A well-organized presentation by the P. G. and E. and Red Seal wiring plan, as well as a service story on gas heating and auxiliary electric heating was told.

Last fall particularly effective meetings were held by the East Bay division of the same company when 30 architects were entertained at a dinner and told in detail the actual cost of electric cooking and the need for adequate wiring. Taking actual billings from 100 typical customers throughout the region, and again from 1,000, and presenting these as concrete evidence of the actual cost of cooking, the architects were shown not only averages but extreme cases either of economical cooking or extravagant use of electricity in cooking. The factual presentation had the effect of setting at rest a long series of misconceptions regarding the costs of electric cooking.

ABERDEEN, WASH., office of the Grays Harbor Railway & Light Co., has been completely remodeled. Windows were changed to allow displays to be placed at the level of sales room, new lighting was provided for both windows and sales floor, and an old balcony was removed.

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TULL & GIBBS, Spokane home furnishing store, has installed in its basement a "Save-a-Step Kitchen" as a feature of its kitchen furnishing display.

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Electric Buffet Entertaining Campaign Gets Under Way

Acting on the theory that every woman is a natural entertainer, especially in the fall and winter seasons, the Electrical Housewares Program, sponsored by the Edison Electric Institute and a group of appliance manufacturers, is making an intensive national drive this month to feature electric buffet entertaining with homemakers as "the modern and popular thing to do."

Driving forces behind the campaign will be a full-page advertisement by the program, an editorial and spreads of attractive table settings in Better Homes and Gardens magazine; distribution of a 36-page booklet on entertaining written by Mrs. Fae Huttenlocher, associate editor of Better Homes and Gardens and a table setting display contest among department stores, utility companies and electrical housewares dealers.

Coast Valleys Wins Hockenbeamer Trophy

Coast Valleys Division of the Pacific Gas & Electric Company, won the Hockenbeamer Trophy for the year 1937 and likewise the right to keep it permanently. Originally set up on a basis by which that division receiving the award three times would keep it permanently, Coast Valleys has now achieved that distinction and keeps the beautiful oil painting permanently as a record of sales accomplishment. Presentation was made to division manager T. W. Snell and sales manager Phil George at a recent sales meeting of the company.

A new and a perpetual trophy to be known as the James B. Black trophy is being offered beginning 1937. It will be awarded the division showing the best over-all attainment of assigned sales quota and control of expenses to budget provisions during the year.

The De Sabla division in which Bill Bowler was newly appointed sales manager last year placed second in the contest and East Bay division under the veteran Lou Galbraith was third with San Jose, under Jack Ross, fourth.

●

SCHOENFELD'S STANDARD FURNITURE Co., Seattle, has just finished a complete modernization of its entire store, providing greater display space for electrical appliances and making use of indirectly lighted open shelves for display of merchandise.

Do the Apparent Things Well if You'll Sell Electric Ranges

"ELECTRIC range dealers who are successful are willing to do the apparent things and do them well," Reese Mills, manager of the range department of Westinghouse Electric & Mfg. Co., says as the result of a survey of 86 successful dealers.

"The No. 1 good range dealers have stores rated at 'good' or better, handle a complete line of electrical household products, have well-trained outside retail salesmen, have a good representative stock of ranges on display, use the complete electric kitchen effectively, advertise ranges in local papers and know how to sell the product on the basis of the features that will appeal to women."

Breaking down the survey, Mr. Mills points to the following statistics for confirmation:

Nearly three-fourths of the surveyed stores were classified by the investigator as "excellent" or "good" as to their outside appearance. Most of them were classified as electrical appliance dealers although the list was high in hardware and furniture stores. Seventy-one of the dealers handled a complete line of electrical equipment.

Sixty-two of the 86 had three or more ranges on their floor at one time. The average was 5.6 ranges. Twenty-three had complete electric kitchens installed on their floor and reported that they were a profitable investment. Others were planning to install kitchens.

Sixty-two dealers had outside retail salesmen, the average being four. Twenty-one stated they secured their salesmen through advertising, 21 from personal contact and 12 from the recommendations of friends. Two-thirds of the dealers held regular scheduled meetings for salesmen and closely followed manufacturers' training courses. Seventy-one believed their men should know how to cook and had thoroughly trained them or were intending to do so. The majority held monthly and seasonal contests for their sales forces.

A few more than one-half of the dealers stated that most sales are closed in the prospect's home. Slightly less than 45 per cent said that most sales were closed in the sales room. "These results," Mr. Mills says, "would indicate the necessity for educating salesmen and 'dressing up the store interior'."

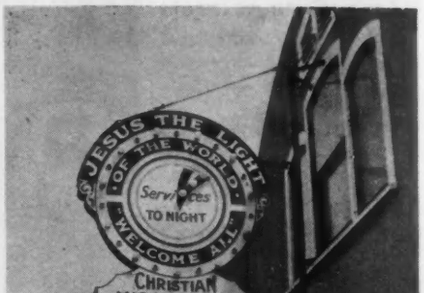
In obtaining prospects the dealers had many methods, most of them employing at least two. Sixty-eight relied on user's suggestions, 44 on walk-ins, 34 on cold canvass, 25 on advertising, 19 on friends and 10 on other methods. Sixty-four of the dealers advertised in local newspapers. All of them were using some form of time-selling. Seventy-three had a regular plan of calling back on a range purchaser to see if everything was satisfactory and to get additional leads.

Paralleling the results of a previous survey of range users were the answers given to the question: What features of the electric range do you as a dealer find to offer the greatest appeal to prospects and users?

Some of the dealers gave more than one reason. Fifty of them favored cleanliness; 23, economy of operation; 22, convenience; 11, better cooking results, and 52, other reasons. With one exception—the rearrangement of convenience in second place, economy of operation in third—these answers also tallied with those of 113 retail salesmen.

Apex Appliances on Display

Showing the complete line of Apex Appliances, Stone & Pearce, Berkeley, Calif., dealers, used manufacturers' display material to good advantage in this striking display. A. L. Baker, display manager, designed the window



Remember the "check seal" dealer signs which all General Electric dealers mounted over their doorways some years ago, some of them still shining nightly? Here is one in Santa Cruz that "got religion"; has been converted to "light the world". It might do a better job, though, if all those empty sockets were filled with Mazdas

Dealers Contacted by Means of Radio

Unique in the field of electrical dealer promotion was the use last month of radio to contact Southern California's 2,000 electrical dealers. The Walker-Pratt Manufacturing Co., producers of Crawford electric ranges, presented over an NBC station meeting of the air directed exclusively to dealers, explaining the 1938 Crawford line and merchandising plans.

This radio program was part of a series of dealer promotions which included broadsides, telegrams and group dealer meetings. These were followed by a radio program, newspaper advertising and an outdoor campaign directed at the consumer. Responsible for the promotion are Fey and Krause, Inc., new Crawford distributors in southern California.

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"THERE IS NO SUCH THING AS SATURATION" is the slogan adopted by M. E. Musgrave of San Diego Consolidated Gas & Electric Co., who managed to prove this out by repeat orders and increased sales for the I.E.S. Lamp Sales Division. Musgrave and his crew operate from a truck stocked with complete light units, shades and attachments. The truck is parked in a selected central point for from three to ten days and is used by the crew of 8 salesmen as a supply depot.

Luncheon Club Meetings Improve Public Relations

An effective means of building good public relations has been developed for the Public Service Co. of Colorado by Frank S. Henderson, manager at Boulder, where the organization has inaugurated a series of luncheon club meetings. Expansion now under way at Valmont plant furnished a timely theme around which to build the program.

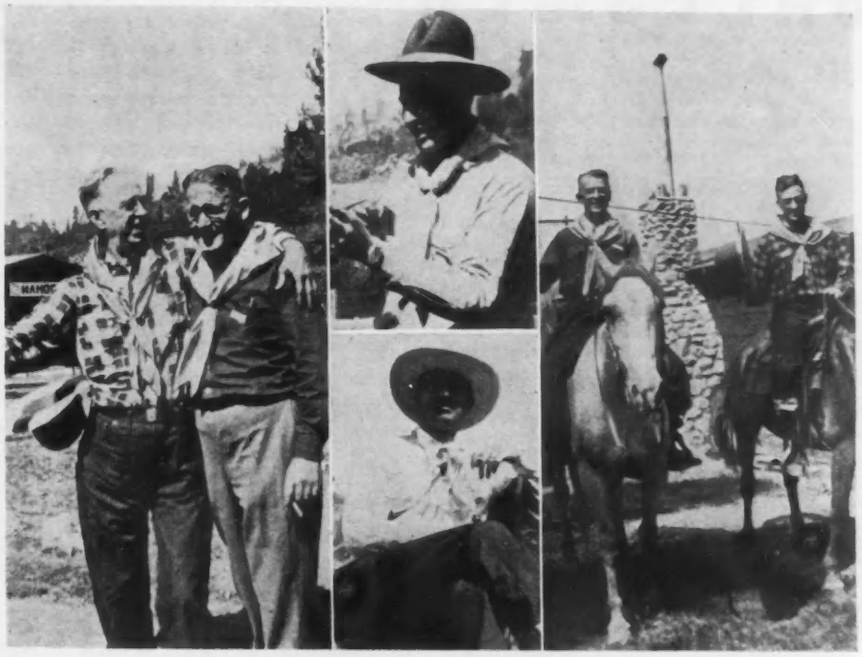
Typical meeting was that of July 2, when 73 members of the Rotary Club were entertained. Mr. Henderson and John Elffman, plant superintendent, greeted the arriving luncheon-clubbers, who were taken to the fourth floor assembly room at the plant and served with tasty box lunches. Following the lunch, Mr. Henderson distributed printed sheets which outlined the economic contribution of the Public Service company to the county and city. In a brief talk he emphasized outstanding items such as county taxes, local purchases of merchandise and fuel, wages paid to those of the community.

He next introduced A. H. Heitzler, superintendent of the company's electrical department, who introduced human interest in a non-technical talk about the Valmont plant and its future. The meeting was then separated into groups which were individually conducted through the entire steam plant by guides, the tour ending with inspection of the expansion work in progress, centering around the new 25,000-kw. generator.

Effect of the meeting was to impress business and professional men of the city with the company's importance as a vital unit of service in community life.

Rotarians at Boulder, Colorado, entering the Valmont steam plant of the Public Service Co. of Colorado for one of the public relations luncheons

Hotpoint Dealers Go Native at Rancho Calrod



Forty-three northern California Hotpoint dealers who had met their quotas in the previous ten-week period threw off the shackles of business, donned wide-brimmed hats and colorful neckerchiefs and assembled at the Hotpoint Rancho Calrod in Potter Valley Sept. 17. Pictured above are a few of the visitors: At left, Herbert Cram, of the Electric Kitchen Appliance Corp., and Harry Wood, Sacramento dealer; top center, Chet Merrill, P. G. & E. representative; bottom center, Clyde Allen, general manager of the Electric Kitchen Appliance Corp. and in charge of the party; right, Ross Van Gundy, P. G. & E. dealer contact man, and Wallace Evans, of the Electric Kitchen Appliance Corp.

WATER HEATER SALES are simplified by the new Westinghouse Electric & Mfg. Co. Estimator, a chart which shows the proper capacity tank and monthly operating cost for families of any type and size. The chart divides families into those ranging from two to eight persons and classes them as "generous," "average" or "modest" users of hot water. Amount of water used by these families and kw.-hr. consumption needed to heat the water to 150 deg. are shown.

Dealer Cooperation Boosts Water Heater Sales in Idaho

A 146-per-cent increase from last year to this in sales of electric water heaters by dealers in Idaho Power Co. territory, testifies to the success of cooperative selling. In 1936 dealers sold 12 per cent of the water heaters. To date this year, they have sold 26 per cent.

Cooperative efforts of the Idaho company began in 1930 when it was decided to give credit on company campaigns for range sales by other dealers. From 10 per cent in 1930, the proportion of sales by dealers grew continuously to 51 per cent by the end of last year. In the same period refrigerator sales by dealers jumped from 9 to 88 per cent of total, with washing machines and ironers displaying similar trends.

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MORE THAN 100 dealers of Vancouver, B. C., recently attended a dinner sponsored by Canadian Westinghouse Co. E. A. Lowden, merchandising manager, and C. N. Presnail, sales promotion manager, both of Canadian Westinghouse, were present to introduce new refrigerator units.

SALESMEN

How can I get salesmen that will do a good sales job? How can I build an organization which is loyal, hardworking? These, according to the survey Electrical West conducted several months ago, are two of nine problems most puzzling to dealers and salesmen in the West. (See Electrical West, Sept. 1937, p. 28.)

Answers were furnished by 200 or more advisory editors engaged for years in all kinds of selling. Sometimes the suggestions are old; sometimes they're new. Oftentimes they are repeated by almost every man. Yet, taken as a whole or in part, they tell the story.

The two remaining problems—How can I get competitors to cooperate and eliminate wasteful selling practices? How can I receive better help from jobbers, manufacturers?—will be answered in the next issue.

How Can I Get Salesmen That Will Do a Good Sales Job?

Determine whether they possess the necessary qualifications to develop into a real salesman capable of advancing from a minor position to one of real responsibility.

Employ men who have had experience in the sale of electrical merchandise. Look out for the windjammer who has held a lot of different positions.

Employ young men who have had training in selling other than in the electrical industry.

Take the best material available and develop it by intensified training.

Offer compensation which will allow a good producer to make an excellent salary.

Get men who have had door-to-door selling experience.

Choose on a basis of personality, experience, enthusiasm, health, willingness to work, education, ability to make friends.

Find men by circularizing heads of non-competing businesses. Interview.

Furnish salesmen with proper and up-to-date selling points.

Go after former utility employees.

Have a personal chat with your salesman. Encourage him, help him and tell him your problems as well as get his.

Get men who are new in appliance selling, who don't know it all.

Supply the slow starters incentive. Suggest the possible prospects and the lines to be pushed.

Keep the salesmen thoroughly educated in latest developments in the fields. Get help from the jobbers, utilities and manufacturers.

Give the newcomers a ground course in electricity.

Advertise for them.

Have the reputation yourself of being active and progressive; carry a full display and advertise consistently. Good salesmen will apply voluntarily.

Be patient.

Encourage loyalty.

Hold plenty of sales meetings.

Get married men over 50 years of age: they are steadier and instill greater confidence in women buyers.

Train young men in your method of business, your method of salesmanship, your trade and its peculiarities.

Offer a salary just large enough to supply the bare necessities plus commissions which, through hard work, will supply luxuries.

Take as much care and time in selecting men as you would in adding a new line of merchandise.

Have your present sales staff bring in for interview any friends or acquaintances who they know would be suitable.

Take men just out of college and trade schools.

Put an advertisement in the local labor journal.*

How Can I Build an Organization Which Is Loyal, Hard Working?

Treat all employees as you would expect to be treated yourself.

Pay living wages, provide proper working conditions and reasonable hours.

Be fair and square; loyalty and the best efforts of your employees will follow.

Do not pamper them; treat them fair.

Interest yourself in your employees and their problems.

Give them sales help in form of advertising, up-to-the-minute information on products, help in analyzing lost sales, assistance in closing hard sales, public recognition of a good job, correcting errors in selling and making good on salesmen's promises even in cases where a mistake has been made.

Know your men; get them to know you.

Work with them.

Have explicit faith in them.

Educate them to their job, then let them do it.

Encourage suggestions.

Give them a feeling of security and backing of the firm.

Be appreciative.

Sponsor sales-mindedness and enthusiasm.

Offer the incentive of some participation in the profit of your business.

Select your men carefully.

Help them to build their own futures on a substantial basis as part of your organization.

Don't use high-pressure methods or unjust criticism.

Work as hard and as long as you expect your employees to work.

Maintain a continuous sales training program with frequent interesting meetings to keep your men pepped up.

Be loyal, hard working yourself.

Proper leadership.

Lay your cards on the table.

Make every man feel he is a partner in the business.

Hold sales contests with prizes; offer profit sharing opportunities.

Don't boss.

Be well acquainted with your employees.

Be firm but fair.

Do not show preference.

Increase base pay; get away from straight commission selling.

Protect territories of outside salesmen.

Eliminate any form of competition between inside sales staff and outside staff.

Hold sales meetings at night.*

* These are the reverse English suggestions of the advisory editor who wanted to have a little fun. Notice, however, that the answers have sense.

Cooperative Radio Drive to Be Launched Oct. 11

Featuring the slogan, "You're There in Person with a 1938 High Fidelity Radio," the electrical industry of northern California will launch its first three-week cooperative radio campaign October 11.

According to Bert W. Reynolds, promotional director of the Electric Appliance Society of northern California, expenditure of nearly $28,000 will be made during the period by the society, the Pacific Gas & Electric Co. and the dealers. Radio programs, advertisements in more than 285 newspapers, display cards, movie slides in approximately 100 theaters, contests and home demonstrations will feature the effort.

A 16-RING CIRCUS was what Nathan Dohrman Co. of San Jose, Calif., had going during the week of June 26 to July 3. Sixteen different appliances, each with a booth of its own, was actively demonstrated all week long by a corps of nine demonstrators under the supervision of Miss Raymond, appliance counselor, Pacific Gas and Electric Co. Bill Guth, store manager, placed an ironer demonstration on the main floor to interest the crowd responding to his extensive advertising and to direct them to the basement where the other appliances were being shown in operation. Stimulation from this unique promotion continued far into July with a large number of sales of refrigerators and other appliances made directly from the floor.

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Public Wants Variety of Time, Labor Saving Gadgets

If results of a survey recently conducted in New York Metropolitan area for Sales Management magazine are indicative of the rest of the country, the electrical industry will have its hands full in the future.

Field workers for the Market Research Corporation of America asked home-owners, both men and women, to tell them of time and labor saving gadgets they would like to have in their homes. The answers were surprising, especially since many of the devices are already on the market.

Here is the list of desires:

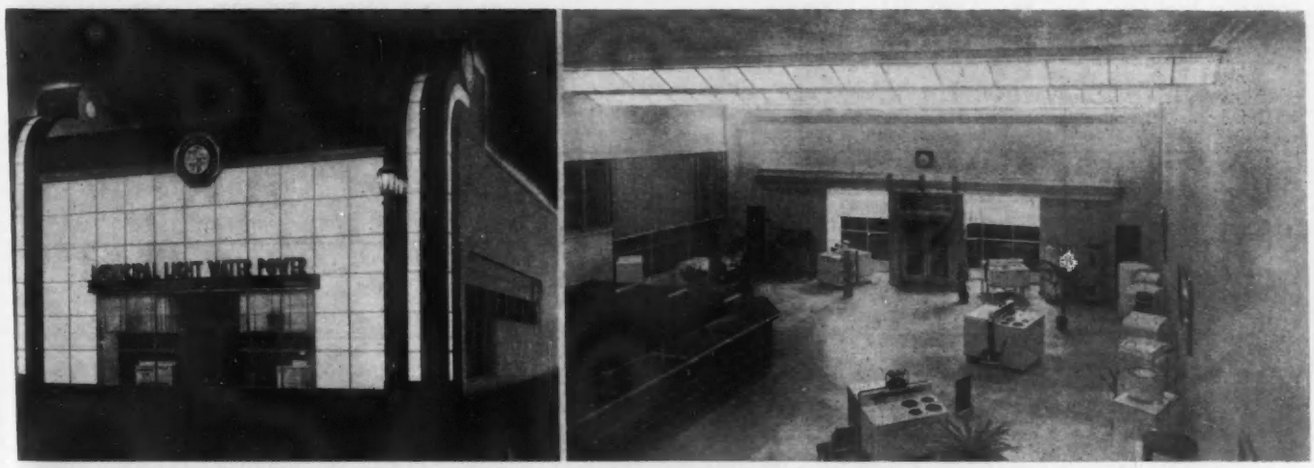
For the house in general: Practical air conditioning system that is inexpensive. Indirect lighting for entire house—built-in fixtures. Gadgets to permit raising and lowering of lights. Cheap escalator for landlords. Electric window openers. A device to help women lift heavy objects. House number to be seen at night. Electric stick with blades (horizontal and vertical) to turn grass edges, and cut out weeds, do hoeing, and which could be converted for use in cleaning cars. Cheap clock that will open and close on electric circuit at specific time. Electric clock with a more silent alarm. Better alarm system in apartments and houses. Doorbell silencer for night calls in apartments.

Moderately priced ironing machine that irons more pieces than at present. Light, cheap electric sweeper to be used on floors as well as rugs. Cheap electric mops for polishing floors and furniture. Lighter weight irons. Electric wringer for washing machines that can be used without using washer. Electric shoe shiner. Electric whisk broom. Inexpensive floor waxer attached to vacuum cleaners. Reduced price on electric shavers. Inexpensive electric brush and scalp massager in one. Inexpensive massagers for the spine and body in general. Electric blankets.

For the kitchen: Garbage grinder adjusted to drain of sink. Electric inhaler that cleans up peelings without the necessity for one to handle them. Inexpensive dishwashing machine. Machine that cleans and dries glasses and dishes well. Electric paring knife with jointed thumb protector. Electric knife sharpener adjustable to various knife sizes. Combination food peeler and separator. Electric hand device to clean pots and pans quickly. Electric wet-mop for washing linoleum. Small electric mop-like machine to polish floors quickly. Less expensive, more efficient, small electric hot-plates, percolators, fruit juicers, egg beaters, strainers, waffle irons, etc. All-in-one cookers which require little or no watching.

Automatic release of ice cubes in all trays. Combination of water fountain and refrigerator. More ice cube trays. Automatic closing of door by spring. Use more of door for storage space. Faster ice cream freezer. Transparent, waterproof, quiet, well-wearing food containers for raw vegetables; for cooked vegetables, compartments. More compact vegetable container for refrigerator. "Growler" of suitable size that will keep beer from two to three hours. Utensil to keep food hot before and while serving.

First of Several New Branch Offices Employs Luminous Front



By using a luminous front, built of glass and enameled steel by Luminous Structures, Inc., the Bureau of Power & Light, Los Angeles, saved approximately $4000 on the architectural facing of the building and provided a dramatic advertisement of electricity. The interior combines a showroom of dealers' ranges, customer service counter without wickets, and a model kitchen in the rear. Note the lighting from light soffits set at an angle to the ceiling

For the bathroom: Automatic control to regulate temperature of water. Room temperature regulated. Indirect lighting at bottom of tub to find soap. Light button near entrance. Electric revolving brush or sponge for back-scrubbing. Electric gum massager plugged near sink. Automatic towel drier. Electric hair washer and massager.

For the radio: Radios hidden in walls and pieces of furniture. Radio in popular colonial style to go with furniture. Radios in bookcases, cupboards, with room for books or other articles. More modernistic cabinets with colored designs. Larger variety of radio cabinets. Radio on an adjustable pedestal. Small portable radio with face on top that can be attached to any piece of furniture. Less cumbersome and complicated large models. More variety of wood to be used in cabinets. Chemical to cover cabinets in order to prevent scratching. Reduced volume control by broadcasting stations after certain hours. Radio speaker with control switches for each room connected with main radio. Automatic volume fluctuation control instrument that can be attached to any radio. Volume set-down control. Inexpensive remote control.

Radios that would turn off automatically at night. Radios in walls that turn on automatically at time important stations are to broadcast. Inexpensive radio with clock indicating change of program. Radio dial marked with stations instead of numbers. Gadgets to permit listener to register approval or disapproval of program and stations. Use heavy celluloid instead of glass. Static eliminator, effective and inexpensive. Elimination of conflicting stations. Better cheap radios with wider station range. Miniature radios which really work and last. Radio for home and traveling. Television. Combination radio and phonograph. Good short wave set. Radios adapted to the current. Music informers. Better speakers in table models. Radio screen grilles to protect speakers from children. More radios adaptable for use of ear phones. More efficient speakers that can produce better tone for local stations.

ROLL YOUR OWN WATER SYSTEM —by Russell

"I'd nearly gamble—without looking—that this contraption is hitched to the wrong pipes."

APPLIANCE SALES REPORT

A Summary of Dealer and Utility Reports Compiled by Associations, Societies, Bureaus, or Dealer Contact Departments of Utilities

APPLIANCE — *August, 1937*	L. A. Bureau of P. & Lt.[1]		Idaho Power Co.[2]		P. G. & E. Co.[3]		San Diego Cons. G. & E Corp.[4]		San Joaquin Lt. & P. Corp.[5]		Southern Calif. Edison Co. Ltd.[6]		Utah Power & Lt. Co.[7]		Wash. Water Power Co.[8]	
	Current	7 Mos.	Current	8 Mos.	Current	8 Mos.	‡Current	‡8 Mos.	Current	8 Mos.	Current	8 Mos.	‡Current	‡7 Mos.	Current	8 Mos.
Ranges	280	2,103	337	3,548	381	2,385			130	1,233	609	4,845	360	3,280	215	1,552
Water Heaters	77	610	156	1,661	218	1,496			74	631	195	1,895	167	1,330	214	1,306
Air Heaters, aux.	8	297	4	369	210	6,205				234	39	1,958	4	915	21	688
Air Heaters, 220	14	90			60	644			25	561						
Refrigerators	3,050	30,202	483	4,893	5,996	29,065			480	5,267	4,431	39,107	1,659	7,838	626	6,622
Dishwashers	7	62	4	14	10	106			2	30			4	37		
Washers	769	10,700	314	2,611	2,665	18,240			408	2,802			862	6,535	599	3,949
Ironers	149	1,965	32	314	499	4,344			68	489	3,029	22,852	56	377	67	353
Vacuum Cleaners	238	4,377	171	903	2,379	17,593			112	972	467	3,561	296	3,937	199	1,915
Radios	1,314	11,955	484	4,320	6,610	64,455			502	4,064	1,049	9,093	757	7,794	1,069	7,703
Mixers	131	1,088	56	519	385	4,721			41	417	4,359	35,031	142	1,539	141	1,179
Cookers, Casseroles	43	272	16	254					53	403	330	3,043	136	683	428	2,712
Irons	412	4,355	460	3,152					410	2,421	69	697	966	8,610	785	6,137
Waffle Irons	92	1,399	111	938					63	627	1,399	11,555	292	2,903	166	1,267
Toasters			123	1,263					133	1,000	386	3,472	312	4,308	487	3,075
Table Stoves	84	1,466	172	1,199					80	759	552	4,900	789	6,538	219	1,769
Heating Pads	30	808	9	383					15	312	207	2,125	54	1,788	95	923
Curling Irons											87	1,930	135	2,442		
Coffee Makers	110	788	145	1,283					86	838	37	435	347	4,059	379	2,788
Sewing Machines			5	137	993	8,488					308	2,661	149	1,026	46	406
Clocks	116	936	59	396					135	959			206	3,033	217	1,926
Fans	204	1,558	312	1,394					261	1,716	475	4,182	715	1,564	440	2,262
Floor Polishers											687	3,825				
Sun Lamps	2	162		49									3	84	1	14
Reflector Lamps			97	1,474					79	1,234	14	318	438	6,035	314	6,425
Miscellaneous Lamps			300	2,622					77	660			428	6,048	611	5,464
Yard Lights									55	386						
Misc. Small Appl.	122	1,120		†					107	1,119	592	5,640				

Sources:

[1] Compiled by Los Angeles Bureau of Power and Light for territory served by that system.
[2] Figures compiled by Electric Equipment Sales Association. Include power company sales and sales of all reporting dealers—about 60%.
[3] P. G. & E. reports sales of major appliances only based on accurate reports available from dealers' accounts. Ranges, water heaters and air heaters include company and dealer sales. Total dealers include gas as well as electric dealers.
[4] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table: Clocks, fans, included under miscellaneous.
[5] Includes dealer reports from Midland Counties Public Service Corporation also. Compiled by Valley Electrical Supply Company.
[6] Includes reports from dealers on San Joaquin Valley system of company as well as Southern California areas served.
[7] Includes Utah Power & Light Company territory in Utah, Idaho and Wyoming. Also Western Colorado Power Company territory.
[8] Dealer sales only for Spokane and company territory. Company sales not included. Table stoves, grills included with cookers.
† Under current month heading is shown previous month's figure. Lag of one month is also shown in total sales for year to date, which began December, 1936.
‡ August report was not included at time of going to press.

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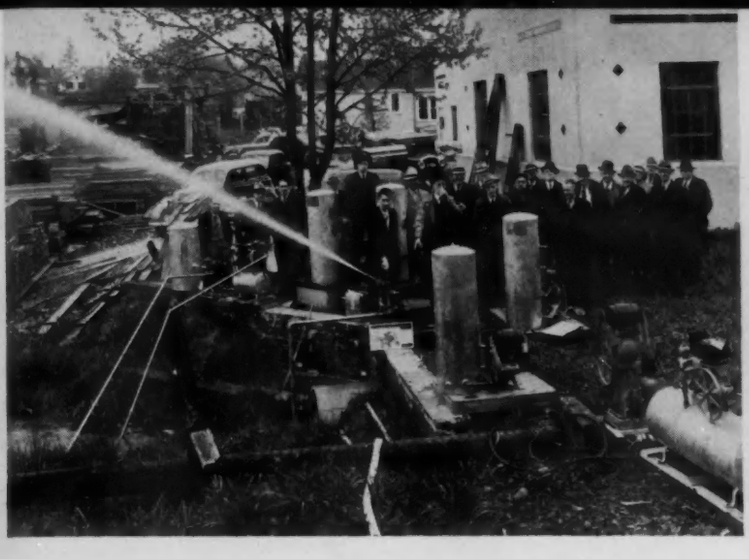
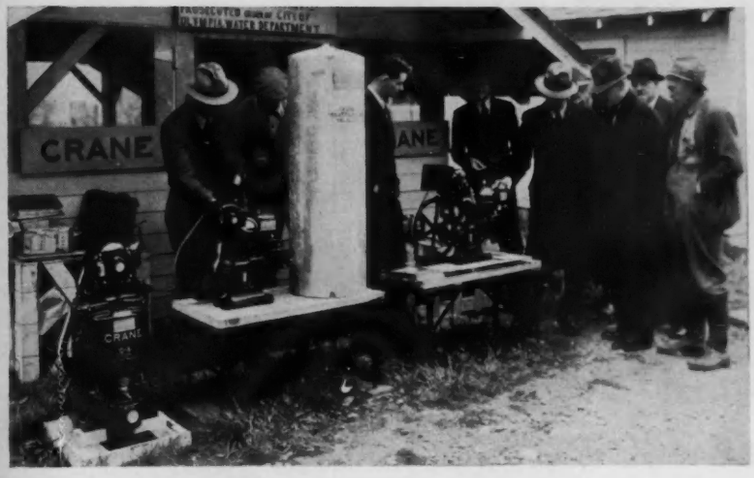


To show is half of selling. So take advantage of such opportunities to show in action the kind of water system you sell as are provided in cooperative demonstrations. A mass demonstration, properly advertised to your prospects, will attract a lot of attention, get many people talking about what a joy it is to have the equivalent of good city water service on the farm, and help you close sales that just need showing to be completely sold. A demonstration like that pictured above dramatizes the protection from fire that an electric pressure water system will bring to the rural home or barn. Get together with other water systems dealers in a local "Running Water" Council and plan ways to "show 'em," whether they are from Missouri or not.



County fairs, stock shows, pioneer day celebrations, or a rodeo in town bring folks from the country in numbers. Stage an electric water system display, showing three or four different types. If possible attach to water supply so that you can demonstrate the equipment working, show the pressure of the water, the volume of flow the customer can get. When talking to prospects remind them of the number of advantages they can enjoy around the place with a good reliable source of running water (see last page of this Guide). The advantage to you of getting together with other pump dealers is that in a joint demonstration you can obtain more publicity, get more people interested, start more talk about electric water systems, and "bird dog" more prospects out from under cover so that you can sell them.

ELECTRICAL WEST COOPERATIVE

APPLIANCE SALES GUIDE

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If they're "From Missouri"

Show 'em

RUNNING WATER
YOUR FAMILY DESERVES IT

Your market for electric water systems never was better. Even the government is talking it up for you. Very first need of every farm and home is water. All of the following can be sold an electric water system: Farmers—for the home first—for stock and dairy, for fruit and vegetable farms, for chicken ranches—to provide fire protection ● Road stands and gas stations away from city water mains ● Tourist or auto camps, homes that rent tourist accommodations or take in summer vacationists ● Summer homes and cottages at beaches, mountains, or country ● Amusement parks and picnic groves, swimming pools, country clubs, and golf courses ● Rural school houses, churches, rest homes and sanitariums ● Even in cities there are prospects among owners of private wells, hotels, small industrial plants requiring special water supply—Don't overlook any of them.

October, 1937

WATER SYSTEM

When you have a good prospect give him a copy of this convincing booklet, prepared by the Electric Water Systems Council. Your electric utility can get you copies

NUMBER 10A

SHORT SALES TALKS That hurdle Sales Resistances

ELECTRIC WATER SYSTEMS

●AFTER ELECTRIC LIGHT, the first requirement of the farm is tap water. Every country home, every rural business away from city mains, as well as every farm needs water under pressure for drinking, washing, gardens, and fire protection. Country service stations, fruit and vegetable markets or stands, packing sheds, beach or mountain cabins, lunch rooms, auto camps or tourist homes also are prospects. There is an excellent market, therefore, for electric pressure water systems, replacing hand pumps, windmills, or the "old oaken bucket." Sale of an electric water system leads to the future sale of a washing machine, a water heater, even a dishwasher. Electric lines so thoroughly cover the rural areas of the West that this is the nation's best market for water systems. Several excellent "package units" are available to fit any but the most unusual case. Although it might seem that the advantages of running water are self-evident and need no selling, certain attitudes of mind or habits often stand in the way of purchase. Note how Bill Smith, the salesman who knows how, plows these objections under by repeatedly turning up the benefits of automatic electric water service. He does not assume that the prospect really knows all about them. He makes sure by reminding him of every buying reason, expressed in the prospect's own interest.

When the prospect says—

***Prospect:* "What do I need of a pressure system? I've been getting along without it a long time. I have a good well and windmill, why should I get a pressure system?"**

HERE is one form of that most common obstacle to the purchase of better equipment—"What I have is good enough"—a self-satisfied attitude. Sometimes it has developed into hardshelled habit. Notice how Bill overcomes this difficult resistance.

BILL SMITH: "What do you need of a modern water system? Well, I can understand your feeling that your present well and windmill should be adequate. You have gotten along with them for some time. Yet you are not interested only in just getting along, I'm sure. You want better crops of vegetables for market. You want a better price for your market produce, your eggs and milk. When you consider that a reliable source of tap water under good pressure will earn you more in your business—farming—to say nothing of the comfort and convenience it would mean to you and your family, I believe you are up-and-coming enough to want to provide for it.

"Your vegetables will look better, weigh more, keep fresher, and your yield will be greater if you sprinkle or irrigate regularly. Your hens will lay more, and the eggs will be better if you provide poultry with plenty of fresh water. One hundred hens need two and a half gallons of water every day for good egg production. An egg, you know, is two-thirds water, so it is very important that your chickens get plenty of water.

"Your cows will give more milk, for the same reason. Did you know that cows supplied with drinking cups in the barn will produce from five to ten per cent more milk on the same amount of feed? It is a fact. Your stock will be healthier. Then besides you will have plenty of water, quick, and under strong pressure for fire protection. That's mighty important out in the country where the fire engines can't go, isn't it? Then around the house, what a treat it will be to have plenty of water, whether there's wind or not, water to wash the milk cans, to irrigate the truck garden, to say nothing of water for kitchen use, baths and drinking. You will get along so much better with first-class electric water service that you'll wonder why you tried to do without it for so long. How about sending one of these units out to your place day after tomorrow? Is that a good time to install it?"

When the prospect says—

***Prospect:* "I can't afford it."**

THIS may or may not be genuine. Just in case it is merely to delay making a decision, and because you want to have him buy from you if he does find himself in a position to do so later, treat this answer as Bill Smith does here.

BILL: "Can't afford it? That is too bad. But when you can afford it I'm sure you will want one of these modern electric water systems on your place for you can put your strength to better use than lugging water. In fact it is costing you plenty to be without it—costing you in convenience by causing unnecessary work, costing you in fire risk, in poorer farm produce and less sturdy stock and poultry. With a water system you end lugging of heavy pails, hand pumping, uncertainty of wind and windmill. Why, do you realize that your family uses an average of seven buckets in the kitchen every day—37 tons for the kitchen alone in one year? That's the work represented in what the average farm wife has to do when she must pump and carry water by hand. You will obtain better health for your family. Your farm will be cleaner. Your gardens grow better and faster. You can increase the value of your property and you will protect it against fire. In some ways this protection alone makes it cost you more *not* to own than to have a good pressure system. A fire is mighty serious in the country. Nearly always it results in a total loss. With a pressure system of proper size, a fire can usually be kept from becoming a big fire by putting a stream of water on it the first five minutes. Then if you run a roadside stand you have water for your customers. If you rent tourist accommodations, you attract better trade with running water in the house. So, just as soon as you can afford it, let me put one in for you. The operating cost is amazingly low. In most cases it is a mere pittance when you weigh all the benefits you get from running water. It is what we call a "plus appliance" for most always its use comes in on the cheapest bracket of electric service rates. Don't you think you could manage to have one right away and let it help you pay its way by the protection and the way it can help you to make more money on your place?

When the prospect says—

***Prospect:* "But my house isn't piped for it. That would cost a lot besides this unit here, wouldn't it?**

LIKE the cost of wiring, it is better to face and sell the idea of installing the pipe than to make excuses and set up negative thoughts which deny your customer something he needs and yourself a sale. So treat this as Bill does.

BILL: "Your house isn't piped? I can appreciate your asking about that. This is true of almost every house that buys one of these water systems, but usually it proves less of a problem than appears at first. The important thing is first to provide the source for obtaining plenty of running water under good pressure. This unit does that. When first installed you can start with one or two faucets and just enough pipe to run to the house and the barn. Then you can add to it as you can arrange for extensions in the future. Why deny yourself water to provide better crops of garden truck, that will sell at a better price? Why be without water that will mean healthier, heavier stock, decreased losses from sickness, greater egg production, more milk production and a way to keep your dairy cleaner more easily? Around the house why go any longer without water for kitchen, bath, and for fire protection? You need water to wash dairy implements, to hose out ice houses, paved floors and walks, tanks, troughs, vats, stalls, gutters, pens. You can do it oftener with less work. You can increase the income from your place appreciably with running water. Why not take this electric pressure system now? Perhaps we can arrange terms on E.F.H.A. for installing it and enough piping to start you off with this modern service." *(If such financing or other similar financing is available this last suggestion can be offered.)*

IN each instance (and it works for any resistance that may be raised during a sale) Bill avoided argument. He said enough to show his prospect that he understood and appreciated how that prospect felt. Then he brought forth all the services which the water system would render and let them overbalance the objection. This is sound selling. Try this method yourself and make more sales.

CALIFORNIA OREGON POWER CO. · PORTLAND GENERAL ELECTRIC CO.
MOUNTAIN STATES POWER CO. · PUGET SOUND POWER & LIGHT CO.
PACIFIC POWER & LIGHT CO. · IDAHO POWER CO.
NORTHWESTERN ELECTRIC CO. · WASHINGTON WATER POWER CO.
UTAH POWER & LIGHT CO.

TALK WATER SERVICE
in Terms of these
ADVANTAGES

In the Home

● Ample water for cooking, drinking, dishwashing, scrubbing, without tiresome and backbreaking hand pumping or lugging of heavy pails. Saves lugging 35 gallons of water per person per day—20 more on washday—37 tons of water a year for a family of five. Saves health, lengthens life, promotes happiness ● Dishwashing made easier ● Can have sanitary toilet facilities ● Baths no longer a week-end luxury ● Water available in sickness or emergencies, or when company comes ● Pride in being up-to-date and entertaining guests as well as in any city.

Fire Protection

● Makes short work of little fires before they can become big and unmanageable ● Big fires in the country usually mean total loss—savings of lifetime swept away (In rural fires 74 per cent of all property involved is destroyed).

Farm Profit

● Milk Production increased where cows have plenty of drinking water, for milk is 87 per cent water. Individual drinking cups for cows have increased milk production 8 to 20 per cent.

● Egg Production increased, for eggs too are largely water. Chickens consume only 2½ gal. per day but plenty of water within easy reach brings maximum number of eggs per year.

● Stock Fattening is aided by plenty of drinking water for the cattle. Healthier, heavier animals, decreased losses from sickness.

● Truck Gardens kept fresher, grow bigger and healthier garden produce when sprinkled or irrigated. Total crop yield is better, quality of crop is higher, farmer can sell larger proportion of his crop at better prices.

● Roadside Stands attract more trade with water service. Produce displayed can be kept fresher by fine spray of water. Spoilage reduced, wilting kept at a minimum. Will attract repeat customers who like the appearance of the stand.

● Tourist Accommodations more attractive with running water.

Value of Property

● Property easier to sell if modern and supplied with water ● Attracts better tenants if renting; better rents. ● Insurance rates reduced by fire protection.

Sanitation

● Inside toilet and bath facilities promote sanitation in the home and better family health.

● Washing of dairy implements easier, better. Milk can receive higher grading when handled in clean, modern manner.

● Cleaning around the farm easier. Milk houses, ice houses, paved floors and walks, tanks, vats, troughs, stalls, gutters, and pens can be hosed out oftener, more quickly, better.

Pictures often tell a story that you find hard to tell in words. Get pictures of the use of water on farms having good water service. Show uses of water, uses that are impossible without a source of water supply. For example, the top picture shows a portable unit, providing water to sprinkle and lay dust around a chicken yard. Below it is seen a sprinkler system for a truck garden. Below that is a remote pump installation at a well. At right is an irrigated berry garden showing the fine healthy growth due to plentiful water. Such pictures visualize for the farmer ways in which he, too, may profit from having abundant water supply

What Can the Utility Do for the Farmer?

By S. S. BLOOM
Engineer, Gas and Electric Division, California Railroad Commission

THE ELECTRICAL industry in California has long been engaged in supplying central station service to farming areas. The unparalleled development of irrigation and the close proximity of extensive farming areas to urban communities are the prime reasons for the high percentage of farms now receiving electric service.

During the early stages of the development there were numerous small utilities operating in the state while at present only about 29 utility agencies afford electric service to farming areas in some portion of its 58 counties. These 29 agencies, operating electric distributing systems, embrace 24 privately-owned public utilities, 3 irrigation districts, one municipality and one water utility of mutual ownership.

There are at the present time approximately 125,000 farms being supplied with electric service, over 91 per cent of which are served by privately-owned public utilities. The two largest of these companies supply service to approximately 75,000 of the total farms served.

Who the Unserved Customers Are

It is not known how many farms throughout the state are without electric service at the present time but the number is probably not in excess of 50,000. To comprehend the problem of attaining a greater degree of rural electrification in California, it is not only necessary that we have this number of unserved farms in mind but also that we have some understanding of their situation, the type of load to be supplied, etc.

These unserved farms comprise domestic service to large cattle and sheep ranches often remote from the nearest town or trading center, large grape vineyards and fruit farms in mountainous sub-irrigated regions, a few areas subject to strictly gravity irrigation where farm houses are generally one-half mile or more apart, small one or two room dwellings, even shacks, and other similarly difficult situations. Of this unserved number there are relatively few which require power service of any substantial amount for irrigation purposes because a very large portion of irrigable lands where ground water is available have been heretofore developed.

Thus the utilities are now largely concerned with making rural extensions to supply service for domestic and incidental small power uses by means of extensions from their widespread and extensive rural lines and distribution networks. This condition has operated to change the complexion of the problem to one now generally of making extensions for a type and unit of load from which the revenues are smaller in proportion to line investments.

Before proceeding to a discussion of the application of extension rule provisions to future rural service, it is essential to briefly view the principles underlying the rule.

Principles Underlying Policy

This rural electrical development heretofore described began, even if in a small way, with the early construction of central station alternating current lines and systems in the urban areas. It was natural that the new enterprises should proceed carefully and that bases and methods of the utilities for making extensions, if at all, into rural areas should be numerous and different. These and other conditions contributed to dissatisfaction and complaint on the part of many farmers. By the time the State Railroad Commission was organized in 1912, the utility managements and their engineers had recognized, and subsequently the Commission perceived the necessity for corrective measures and the advantages to the State to be derived.

After formal investigation involving extension rules, among others, the commission issued during the year 1915 its Decision 2689 setting out certain basic principles relating to electric and other services, namely:

1. "It is not feasible at this time to set forth a general rule defining free limits for extensions outside of municipalities. The Commission naturally desires the utility to be as liberal as possible in the construction of extensions, but regard must also be had of the utility's financial condition and the rights of existing consumers."
2. "The Commission has frequently drawn attention to the fact that it is unreasonable for utilities to urge that each extension constructed at their cost must be profitable in itself. Such a policy would lead to grave results in thwarting the development of the State and cannot be permitted by the Commission."
3. "A water, gas, electric, or telephone utility shall make such reasonable extensions in unincorporated territory at its own expense, as it can agree upon with the applicant for service, provided that in any case in which the construction of an extension at the utility's sole expense will, in its opinion, work an undue hardship upon the utility or its existing consumers, the matter may be submitted to the Commission as provided by Sec. 36 of the Public Utilities Act, unless satisfactorily adjusted by an informal application to the Commission."
4. "Utility should own all facilities which it uses to serve the public. Endless difficulties and annoyances arise under any other rule. Payment therefor by a consumer should be regarded as a loan to be returned under reasonable conditions. The title to the extension should be vested in the utility."

With these guiding precepts as a starting point, an orderly program was initiated. The present form of extension rule in general application throughout the state has, through successive steps, become the outcome. This form of rule provides, in brief, that the utility will construct a certain length of overhead line at its own expense (free, so-called) for each type and unit of load desired to be served, such as lighting, refrigeration, cooking, motors, etc.; that the utility will furnish, install and maintain all necessary transformers, service drops and meters at its sole expense; that necessary lines will be constructed on public roads or on private property, if free right-of-way is available, with the proviso that if any length of line in excess of the so-called free length is required, the consumer or consumers shall make deposit therefor with the utility; and finally that line extension deposits shall be subject to refund on two bases, first, that a refund equivalent to some flat percentage of bills of original customers, except lighting only, will be made, and, second, that refund will be made for such new units of service which shall be supplied to customers other than the original consumers, provided that no refunds will be made after ten years from the date the extension was placed in service. The rules of some of the utilities, while of this form, vary in the lengths of line constructed at utility expense, and in the advance for line footage beyond the free length.

Variations of line costs in dissimilar localities, because of differences in line design or voltage, and variations in revenues, are the principal factors which account for these extension rule diversities. The rules and principles here outlined, with such future improvements and modifications as may be initiated, are the conditions under which new rural customers can secure electric service from the utilities, and under which further electrification and agricultural development can proceed.

Problems Involved

The broad question to be answered by the agency offering electric service to farmers, or any other class of service for that matter, is what can be done for further electrification within the bounds of sound economics, intelligent engineering, and the maintenance of a proper relation with the rights of existing consumers.

The extension rule is the utilities' expression of exactly what can and will be done for each consumer or group of consumers, giving consideration to the electric rates which apply to the service; the quality of service to be afforded the new consumer; the standard of safety demanded with respect to work-

men, consumer, and general public; and all other factors which have been taken into account by the utility and the regulatory body. Obviously, what the utility can do for the consumer is dependent upon the following factors:

(1) The character and volume of service desired;

(2) The distance from the nearest distribution line or system or other feasible source of energy supply;

(3) The relative location of the new customer with respect to other potential users, i.e., customers density per mile;

(4) The ability of the consumer to afford payment for service on the basis of the monthly electric rates applicable together with an advance or deposit to cover excessive line investment if such is required; and finally

(5) The ability of the consumer to finance residence wiring and utilization equipment.

A clear understanding of the relationship between the extension rule principles and these factors may be gained through the actual application of one of the extension rules. Under the basic rule which has been described, the California utility makes an investment in primary or secondary line, or both, in transformer, service drop and meter ranging from $125 to $175 to serve a rural domestic consumer who may require no more than lighting service. This type of consumer, of course, generally uses some small household appliances such as an iron, radio, toaster, etc., but naturally this usage is limited. Assuming he uses 40 kw.-hr. per month, which is not far from the average for such a consumer, he will pay $2.70 per month at one of the typical rural residential rates* or $32.40 per year.

Revenue Equals Fixed Charges

An investment of $125 to $175 might appear to be insufficient with respect to the indicated revenue. However, the fixed charges on the direct new investment covering interest, depreciation, and taxes plus energy cost for generation and transmission, together with operating and maintenance expenses of the distribution equipment, all of which constitutes the cost of rendering the service, are fully equivalent to the revenue received. Hence, if the costs to deliver the service are, on the average, equal to the bills he is required to pay, it must follow that no larger investment is warranted if the customer is to pay his own way.

Before making an accounting of what happens to be the revenue received from the consumer, another representative type of user should be described. Taking, for example, the case where a new consumer uses a range and refrigerator in addition to lighting service, the investment made by the utilities in applying their extension rules will be increased to an amount ranging from $325 (approximately 800 ft. of line with transformer, service drop and meter) indicative of the lower limit, and $450 (approximately 1500 ft. of line with transformer, service drop and meter) indicative of the application of the most liberal rule. This range of investment arises mainly from the fact that the line costs are, for simplicity, expressed as free line footages for the different types and capacities of load served with certain variations existing between rules of the several operating utilities. Whether or not these variations are justified, however, is a subject for more intensive study, and is not the point of this example. If this customer, whose service consists of lighting, range and refrigerator use, consumed 150 kw. hours per month or 1800 kw.-hr. per year, he will pay $6 per month on the basis of the typical rural residential rate cited, or $72 per year.

Why the $72 Is Required

Again, this direct investment of $325 to $450 may appear to be insufficient in the face of the indicated revenue of $72 per year which the utility or serving agency will receive. To inquire into, or explain, this relationship, it becomes necessary to account, in some manner, for the reasons of the utility, or serving agency requiring the payment of this revenue, $72 per year in this case.

Obviously, any answer to this implied question deals in some manner or other with every element of the utility business, whether the service be supplied by a publicly or privately-owned serving agency. Consequently, it is appreciated that any figures used may be controverted. Nevertheless, if a figure of 10 per cent is assumed for fixed charges covering interest, depreciation, and taxes, as applicable to the direct investment for line transformers, service drop and meter; and an average charge of 1.25 cents to 1.5 cents per kw.-hr. is applicable as covering the cost of delivery of energy to the line constructed for the new consumer, including the generation, transmission and handling of the energy through the general distributing lines or network; and an average of 50 cents per meter per month is assumed to cover commercial expense of meter reading, billing, collecting, etc., it will be readily evident that any remaining difference between $72 and the sum of these indicated costs will be no more than necessary to cover distribution, operation and maintenance expense with general and administrative costs chargeable to the new line extension itself.

This is only one view of the problem of service to the rural customer and is confined to an attempt to indicate by example what is done here to afford service to the rural areas, how it is being done, and what its justifications are rather than endeavoring to discuss all economic issues involved.

If the line costs and investments are changed, or interest, depreciation, and tax expenses are different than those used above, or if the electric rates are higher or lower, it will readily be seen that the problem of making a line extension for a new consumer is correspondingly changed. The application of the extension rules must, of course, reflect averages.

Extension Rule Factors

Utility engineers and regulatory bodies have long been concerned with this problem of developing a proper basis of extending service to new consumers where particularly a substantial investment is required, or some investment is necessary beyond that which has been required by, or may be assumed to be assignable to the average consumer of a class. To this extent the problem is not new. There have been, in the various states, many different bases and plans developed and used in making line extensions to rural consumers. In constructing these extensions to serve new consumers in rural territories, all of these bases and plans deal in one way or another, directly or indirectly, with the following factors among others:

(1) Direct and indirect investment.

(2) Treatment of line extension advances or loans.

(3) Rate for service.

(4) Consumer load characteristics.

(5) Quality of service.

(6) Safety of workmen, consumer and general public.

In addition to their simple treatment by an extension rule, these factors bear certain relationships to each other, which demonstrate intangible elements in the extension of policy problem.

It appears that no extension basis would be sound if greater average distribution line investment is allowed for the new consumer than is assignable to the existing similar consumer, because under that principle the rates of existing users would face increases. In other words, if larger expenditures are made for prospective consumers than have been made for existing consumers, the latter have every reason to urge that their rates and charges be not increased thereby. This principle commands that any basis predicated on increment cost shall be justified. The forms of rule applicable in California require that any expenditures in excess of that to be made by the utility shall be covered by an advance to be made to the utility

* This charge calculated from rates of a utility serving 45,000 farm customers.

by the new consumers served, such advance to be treated as a loan and thus subject to refund. The provisions for these refunds are reasonably liberal because in a very large percentage of cases they have been refunded. If they have not, it is probable that the hardship to the depositor has been no greater than that suffered by the utility and its general consumers because the utility has thus been called upon to bear the operating, maintenance and replacement cost perpetually, for an excessive length of line, which otherwise would have been owned by the consumer and thus maintained by him at his own direct expense.

Advantageous Rates

Rates for rural service in California are known to be advantageous to the farm customer. If they were higher, and the farmer in general was willing to pay them, and, thus, higher bills for his service, then the new consumer who would pay them would be properly entitled to demand that the utility make a correspondingly higher investment. In turn, this would mean that the utility would construct longer lines at its expense than it now builds. But we know that the farm customers are accustomed to low electric rates and will complain bitterly at any general increase in them. And even if the new customer agreed to pay higher rates than his neighbor to secure service without making a line extension deposit, we know he would not long be satisfied and that a difficult situation would be created. Thus, investment in and expenditures for new extensions are directly influenced by rates and are limited by them.

Consumer load characteristics are a common ailment or virtue, and, therefore, the farm customer does not have them as something peculiar to him alone. There are many considerations which must be accorded them in making and fixing rates. This phase of the subject of electric service is merely mentioned here for the reason that the rural line extension rules do not inflict any penalty because of farm customer loads as a class. The loads of rural customers, and their relation to line capacities and costs, is a matter for future study as effecting rates, extensions.

Rural customers in California have become accustomed to a high standard of service and a high degree of safety as well as a relatively low level of rates. The question arose several years ago as what could be done to reduce cost of lines in order that utility systems could be extended greater distances to serve not only new farm residents but also many which are unserved because of their relatively long distances from existing lines. These elements of quality of service and safety in rendering service directly affect line costs and operating expense and thus are important factors affecting extension policy.

Program for Further Progress

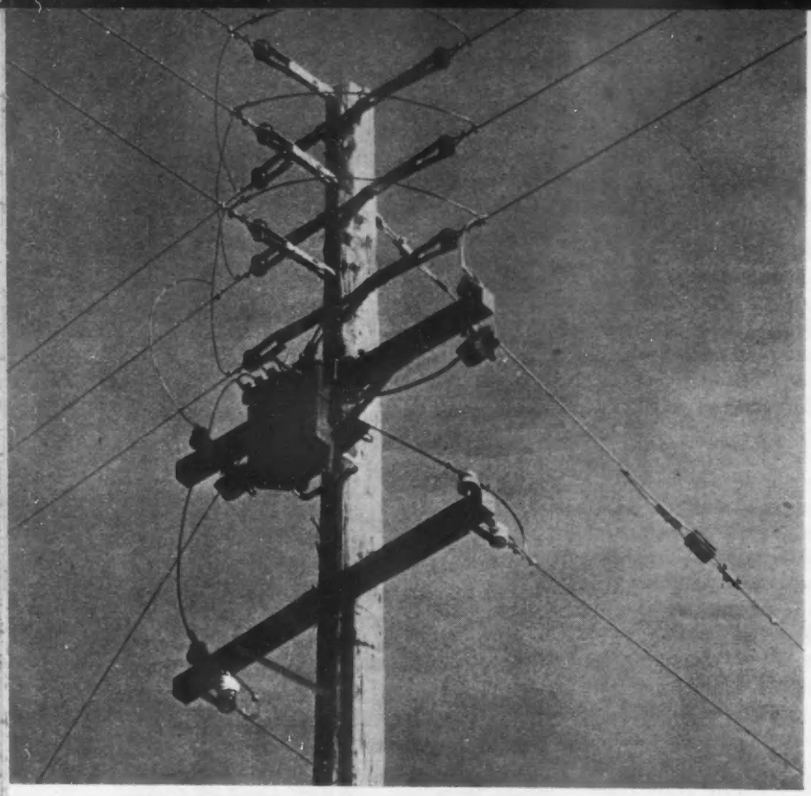
Rural service in California, due to precedent established and the dependence which farmers demand, must now be of a high order. If unsatisfactory voltage variation or undue interruptions, either as to number or time duration, should result from any attempt to reduce line and system costs, it is certain that the farmer would not benefit thereby and moreover would complain against them. To clearly state the problem, the utility and its distribution engineers and operating departments are faced with the situation of reducing line costs without sacrificing quality of service and standard of service, and without an increase in operating expenses.

Through the initiative and endeavor of the utilities, the farm organizations, and the State Railroad Commission, and their cooperative efforts, the matter of accomplishing all possible liberalization of extension rules and policies was undertaken as a problem for special study and research. While it cannot be said at this time that the end has been reached, nevertheless, rural line costs, even in the face of rising labor and material costs, have been materially reduced and correspondingly extension rules have been liberalized which definitely demonstrate that progress has been made. These reduced line costs have largely resulted from two causes, first, reductions which the utilities are making in their own construction standards, and second, modification of rules provided in General Order No. 64A, "Rules for Overhead Electric Line Construction," of the California Railroad Commission.

Regarding changes in utility construction, it must be realized that any reduction in company construction standards involves practices which have been developed through long years of practical experience. Changes in construction standards which would produce lower capital costs and at the same time result in increased operating expenses would be misleading and unacceptable. It is true where a line extension rule is stated as a relationship between free length of line and thus direct investment, and units of load served representing average revenue, that with decreasing line costs and fixed revenues, the length of line can be increased to reflect the cost decrease. This principle only holds good, however, provided the line facilities of the lower cost will last as long as those of higher cost and provided operating and maintenance expenses have not been materially increased as the result of the decrease in these line costs. Furthermore, it must be recognized that the utility cannot afford to decrease safety where its employees, or the consumer, or the general public are concerned. And finally we must accept the condition that the farm user will be dissatisfied with a lower grade of service than has generally been established in rural areas, regardless of the kind of a line which has been built to serve him. To accomplish the desired purposes, distribution line costs must, therefore, be reduced in the face of these obstacles. As indicated above, the task has not been hopeless. By use of newly-developed materials and methods, study and modification of line design, and reductions of line clearances, costs have been reduced. To exemplify this recent endeavor in the modification of utility standards for rural construction, the companies are now, in many cases, increasing pole spacings, reducing clearances of wires above ground, using many single crossarms where double arms were formerly used, placing transformers on line crossarms on single-phase lines, etc. While many of these changes are experimental, it is not too much to expect that many of them, if not all, will be adopted as new standards for rural line construction, with the possible exception that standards for main rural feeders will undergo less change.

Deviations Are Permitted

Respecting modification and development of overhead line rules of the Railroad Commission, the commission, recognizing its responsibility and duty to the public, has directed its engineering staff to give the matter special study to the end of assisting in the reduction of line extension costs in every possible way. As a result of this attitude, deviations from the overhead line rules, applicable to rural lines were issued during November, 1935. Many miles of lines employing these deviations, or at least some of them, and also reflecting modification of utility standards have been constructed. In some instances the reduction in line costs has been as much as 25 or 30 per cent, but the average will probably not be as large as 25 per cent. Also, extension rules and policies have been liberalized as a consequence of this work. Each utility has its own extension rule problem and some have made more progress in the movement than others, due to varying conditions surrounding their particular situations. Now that this movement is well under way, it can properly be expected that further study and consideration will be given to line extension relationships and rural line design. Only in this way can the utilities and the commission fulfill their obligation to the farmer and to the further agricultural development of California.



Typical 4.6-kv. vertical corner with three-phase branch take-off and transformer installation for a secondary service line

Palo Verde Valley, California, is sparsely settled. Nevertheless, Nevada-California Electric Company was able to bring it electricity because

Rule Deviations Reduce Rural Line Cost

By W. B. LOPER
Assistant Distribution Engineer,
Nevada-California Electric Corp.

AS PART of a cooperative program undertaken by the California Railroad Commission and various California utilities to determine the feasibility of permitting deviations from construction requirements in order to lower construction costs in rural areas, Nevada-California Electric Co. this summer completed a 67.4-mi. rural electrification line serving 173 customers. Built at an estimated cost reduction of from 15 to 20 per cent, the line is located in sparsely settled Palo Verde Valley.

This valley, consisting of about 90,000 acres, lies in the southeast corner of Riverside County. Here the elevation runs approximately 250 ft. above sea level; the winters are mild, with minimum temperatures of 25 deg. and very little wind or rain, and the summers torrid, temperatures ranging from 95 to 125 deg.

Major valley crops are cotton and alfalfa. However, with winter stock feeding becoming a very important industry and dairying beginning to assume some importance, possibilities of increasing the rural electrification load are likely to be constantly increasing until a time when the area is comfortably populated and the land reaches a point of agricultural saturation.

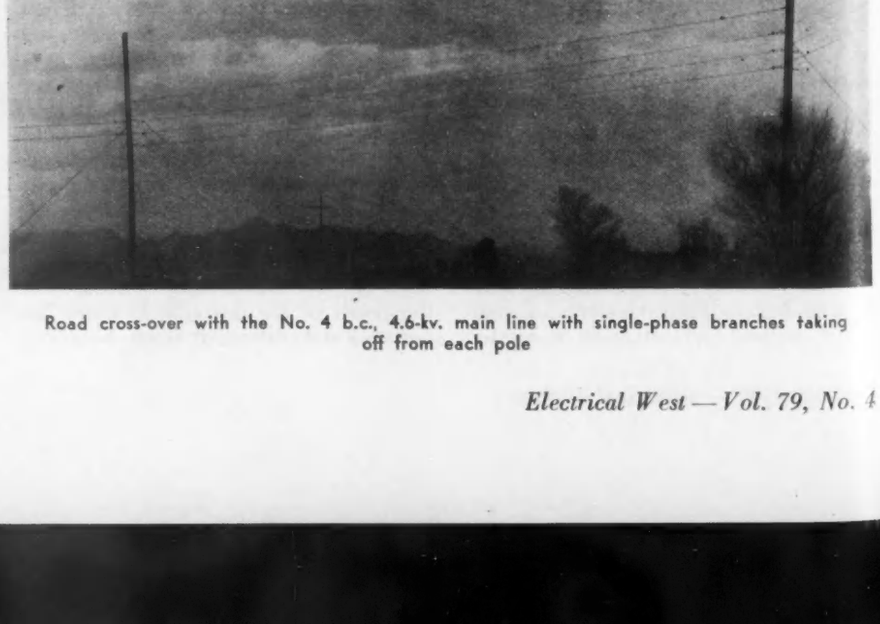
Interested in the possibility of participating in the Federal Rural Electrification program, the Nevada-California company early in 1936 made a survey of the valley and prepared a small scale map showing location of all unelectrified dwellings, all main feeder lines and some of the more important branches which would pass 3½ to 4 houses per mile. This map was then submitted to the Railroad Commission, which, after holding a public hearing, issued Decision No. 29,177.

Under provisions of this order the company, although cautioned to work on an experimental basis where the cost to revenue did not exceed a six to one ratio, was permitted to deviate from its regular extension rule and build lines approximately as planned. Further provision was that any losses or deficits resulting from construction and operation should be charged, not to consumers, but to surplus.

From this point work proceeded logically.

The preliminary map was turned over to the commercial department of the company and new-business men were sent into the field to find out how many farmers would take electricity and what loads might be expected. With this information, plus field engineering details determined at the same time, the exact route of the lines was laid out. Additional branches were added only when the load was sufficient to justify the extension on a six to one cost-to-revenue ratio.

With consideration being given a 4-kv. star, 4.6-kv. delta, 8-kv. star and 11-kv. star, a careful study, based on an ultimate population growth of one farm to every 20 acres of usable land, was made as to the most economical distribution voltage to be used. As all



Road cross-over with the No. 4 b.c., 4.6-kv. main line with single-phase branches taking off from each pole

valley irrigation is done by a canal system with a gravity feed from the Colorado River, there were no pumping loads in prospect. This left small domestic loads, requiring almost as many transformers as customers, to be served. On this basis, therefore, and with some allowances for increased demand per customer, cost estimates were prepared to determine the investment required to serve both the present and future loads.

The 11-kv. distribution voltage was dropped for five reasons: (1) The cost per kva. for small units is considerably higher than for lower voltages. (2) Since 11-kv. was not in use on the system, its use through the valley would mean the stocking of many more items and increased storeroom costs. (3) Due to the size and shape of the valley, it was unlikely that any saving in the number of sub-stations required to serve the final load at 11-kv. star could be made over that which would be required at 8-kv. star. (4) Because the city and rural loads could be served with one substation with voltages of 4,600 to 11,000, the cut-over from 2,300 to 11,000 volts in the city would, by reason of insulation, added conductor separations and transformer costs, be more expensive than the cut-over from 2,300 to 4,600 volts. (5) The temporary modification of the Railroad Commission's construction restrictions applied only to lines with voltages below 7,500 volts and the savings in costs could not be realized for 11-kv.

Based on the cost of serving the present load, the 4-kv. had a slight advantage over the 4.6-kv. For the ultimate load, however, the 4,600 volt system cut-over to 8-kv. showed a substantial saving. All the pole line hardware and insulators and some of the cutouts then being used on the company's 2.3-kv. and 4-kv. systems could be used for 4.6-kv. Because most of the branches would be single-phase, the 4.6-kv. afforded much better regulation than the 4-kv. Therefore, 4.6-kv. delta was chosen as the distribution voltage. But transformers having a two-section primary winding were specified so that they could be used where the company had 2.3-kv. or 4-kv. star systems.

Most important modification made by the Railroad Commission was in clearance of Class "L" conductors (750 to 7,500-volt) above land capable of agricultural development. This was reduced from 25 ft. at 60 deg. F. to a minimum of 18 ft. under the most extreme conditions. To determine the minimum pole heights, the conductor sag was figured at 130 deg. F. and increased by 20 per cent to allow for stretching and settling.

Hard-drawn copper conductors were used for feeder lines requiring a conductivity of No. 6 copper or greater, and No. 8A Copperweld was used for the lighter loaded areas and branches. Since the valley is a light-loading area, copper spans of 440 ft. were used with 35-ft. poles and a minimum clearance of 18 ft. was maintained. The copper was strung with a tension of about 25 per cent ultimate at 60 deg. F. This resulted in a loaded tension of about 35 per cent ultimate at 25 deg. F. and an 8-lb. wind. Copperweld was used in spans up to 660 ft. on 35-ft. poles and up to 520 ft. on 30-ft. poles and was strung with a tension of 30 per cent ultimate at 60 deg. This resulted in a loaded tension of about 40 per cent ultimate at 25 deg. and an 8-lb. wind.

Choice of span lengths was dependent on three factors: (1) The territory is flat and cut at half-mile or one-mile intervals by irrigation canals and laterals. These canal banks are higher than the rest of the land, so it was advisable to place a pole adjacent to them. (2) Since the land is also divided into parcels of 20, 40, 80 and 160 acres with property lines 660, 1,320 or 2,640 ft. apart, it seemed desirable to place poles near the most important of these lines. Spans of 220, 330, 440 or 660 ft. were therefore employed. (3) Because of the small number of homes to be served, the greatest economy was necessary to make the program an economic success. Hence the longer spans of 440 ft. for copper and 660 for Copperweld.

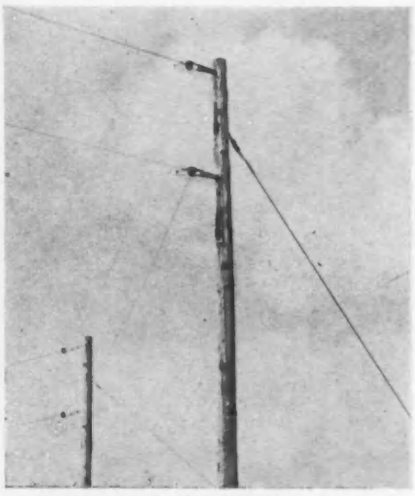
Eight-pin crossarms were used on main feeders with two wires on one side, one on the other. This left a position for a future primary neutral when cut to 8-kv. star, with a spacing of three ft. between conductors. Six-pin arms were used for minor three-phase lines with the center wire staggered, and for single-phase lines where a future third phase was anticipated. The center span spacing with three wires on a six-pin arm was 3½ ft. Both these arms were supported by standard angle braces. Four-pin arms, supported by a single, ribbed flat brace, were used for the single-phase lines giving a conductor spacing of five ft.

Poles were butt-treated, non-class cedar, having minimum top diameters as follows: 25 ft., 5 in.; 30 and 35 ft., 6 in.; 40 and 45 ft., 7 in.; 50 ft. and above, 8 in.

Actual cost figures for the project are not yet available. Based on a preliminary analysis, however, the estimated cost, including right of way expense, transformers, secondaries, meters and services, is $78,315, or $1,162 per mile. Cost of the No. 8A single-phase line on 35-ft. poles with some high poles for canal crossings is, after subtracting transformers, meters and services, about $750 per mile.

Project Resumé

Miles of line	67.4
Estimated cost	$78,315
Estimated cost per mile, complete	$ 1,162
Customers connected	173
Customers connected per mile	2.6
Estimated revenue per customer per year	$75
Average merchandise sale per customer	$172
Saturation of ranges when job was complete	25%
Saturation of refrigerators when job was complete	57%
Saturation of water heaters when job was complete	7%
Customers with one or more major appliances	65%



Left: This construction of a 90-deg. inside corner at a road intersection avoids the necessity of stubs and guys across the road. Above: Construction used to provide clearance for a secondary service line crossing over a high canal. The lower arm supports the 4.6-kv. circuit paralleling a road. Armored concentric service cable protected by wood moulding carries the 110-volt secondary up to the top arm. Single flat braces are used for the 4-pin arms.

Jasmer extension angle structure

Small Rural Loads Reached Through High Strength Steel Wire

By B. H. AARON
Asst. Engineer, Northwestern Electric Co.

HIGH strength steel wire is used by Northwestern Electric Co., Portland, Ore., to serve small loads in lean rural districts thereby making it possible to give service to farms which could not be economically served with higher cost conductors.

Extensions using steel conductors are usually built along public roads, although private right-of-way is used when saving in cost can be accomplished. The majority of the lines are single-phase 2,400 - volt, supplemented with 6,900-volt and 11,000-volt circuits. Steel conductors are used for low capacity lateral lines only where future load growth will be nominal. Customers served in this manner generally have small farms with minimum lighting loads.

The lines are of crossarm-type construction except for angles, and part of the dead ends, these being made up in a vertical plane direct to the poles. Poles are 40-ft. cedar, class 4 or better, butt treated with arsenic paste.

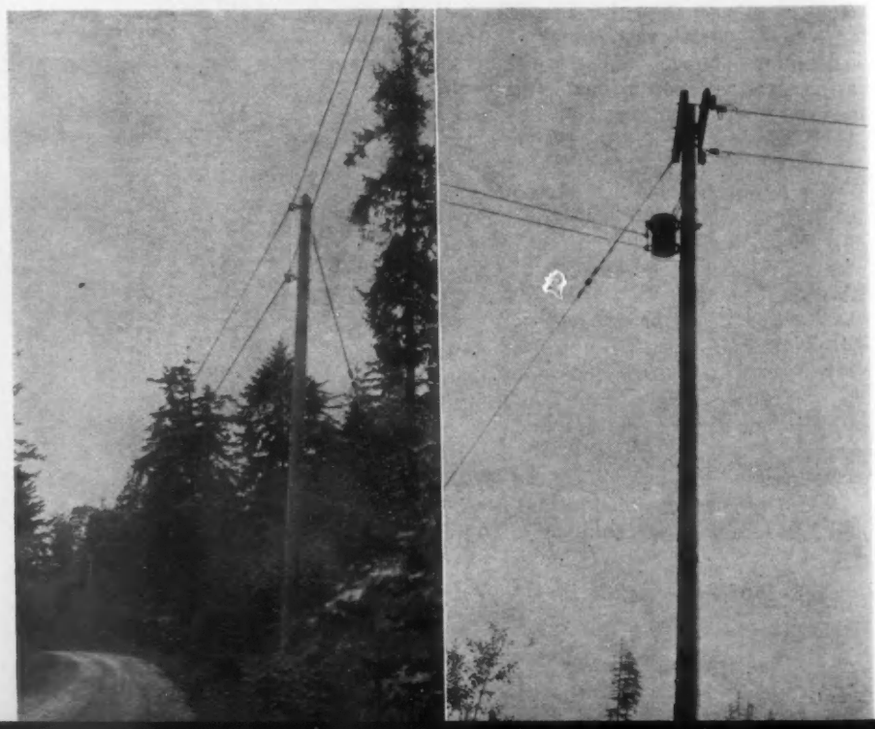
The company's Engineering Department selected a conductor consisting of medium-carbon steel, galvanized, solid No. 6 wire, A. S. W. G., with a breaking strength of approximately 4,000 lbs. The conductivity is equivalent to No. 14 copper. This is considered sufficient for the short, lightly-loaded branch lines. Maximum span length is 700 ft. At normal summer temperatures the conductor is strung to a tension of one-sixth its ultimate strength. At 90 deg. F. the sag is approximately 9 ft. 0 in. With medium loading the conductor is stressed to one-third its ultimate strength.

Four types of splices were tested before finding two which proved suitable for this conductor. The ordinary Western Union splice, plain and soldered, was tried and found to be unsatisfactory. A bar-type clamping device was made up from a piece of crossarm brace about 13 in. long with holes drilled in each end to take one-fourth inch Crosby clips. The wire ends were twisted together and the splice clamped to the bar by means of the two Crosby clips. This splice will develop the strength of the wire but is hard to make up in the field. A compression type splice has proven satisfactory and is used for making up the splices when the extension is first built. It is not satisfactory for maintenance trucks for two reasons: it requires special tools for all the trucks; it has to be made up on the ground. An automatic splicing sleeve with spring-actuated gripping jaws meets all requirements and is used on some of the original installations as well as for emergency.

Dead ends are made on guy insulators by doubling the end of the wire back through the insulator hole and clamping with two Crosby clips. On higher voltage lines, disc-type insulators with large radius thimbles are employed. The dead ends with all equipment including the guy are made up on the ground before raising the pole. This eliminates the necessity of climbing the pole after setting. The same procedure is followed with small transformers, which clamp direct to pole. The service drops are attached to the secondary rack mounted on the transformer, while the pole is on the ground. On tangent structures it is necessary to climb the pole only once to sight in the sag and to tie the line wires to the insulators. On angle structures, the wire is carried on spool-type insulators, except for the higher voltage lines, on which disc-type insulators are used with suspension clamps.

For the structures having heavy strains, 3/8-in. guy strand is used with 7-in. expanding anchors. For other guys, 5-16-in. guy strand or some of the No. 6 steel wire is used.

Example of angle structure, left, and dead-end structure, right, on a Northwestern line



Modifications by P. G. & E.

By C. E. YOUNG
Assistant Engineer of Operation
Pacific Gas & Electric Co.

MODIFICATIONS in the California Railroad Commission's General Order No. 64-A have resulted in Pacific Gas & Electric Co.'s recent construction of 25 rural extensions, involving approximately 63 mi. of pole line, which were not justified under standard construction methods. Actual cost of four typical extensions(three of them 11-kv. single phase; one, 4-kv. single phase) totaling 29 mi. of line was $1,357 per mile. This covered cost of pole line, including rights of way, clearing and correcting telephone interference, plus installed costs of transformers, meters and services.

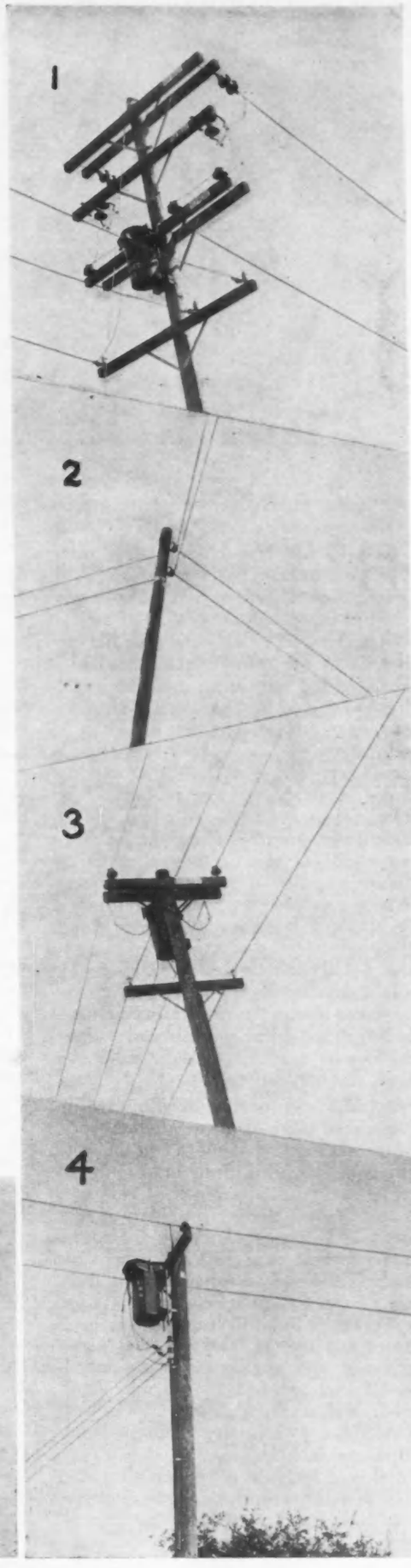
Construciton details are as follows:

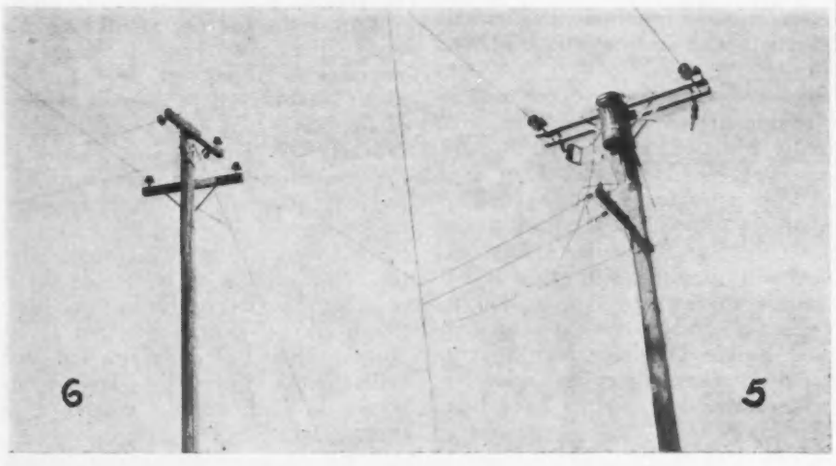
Except where higher poles were needed, 30-ft. standard poles were generally used. Span lengths ranged between 300 and 400 ft. depending on local conditions. Five and seven-ft. crossarms were used for single phase extensions, the actual choice left to the judgment of the local superintendent. A pole top or king pin will be used for any future third phase wire. If the line were three phase when built, a crossarm of 7 ft. minimum length was installed. Wherever practical to do so, single crossarms were used at angles with steel pins in place of double arms.

Primary conductors generally employed were: Nos. 6 and 4 medium hard drawn copper; Nos. 4 and 2 seven strand aluminum steel reinforced, with armor rods at each pole support; Nos. 6A and 4A Copperweld-copper three strand, and, limited to those extensions which were short tap lines and where the connected load was of small magnitude, iron wire. Secondary conductors were medium hard drawn copper or Copperweld-copper. Brackets and secondary brackets were used in cases where they were more economical than the standard line and buck arm construction.

Conventional anchors, preferably cones; malleable iron guy fittings, and, except in instances where common guy strand met the Railroad Commission's requirements, high strength guy wire were used. Guy guards were eliminated if practical and if the commission's orders permitted.

Distribution transformers were hung on the line arm of single phase extensions. Usually, where transformers were tapped off the main line (single phase), primary cutouts were installed on the line arm with the transformer. Eleven-kv. transformers used on single phase tap lines were protected with secondary cutouts only. However, the tap line was protected with primary cutouts at the point where it tapped off the main line.

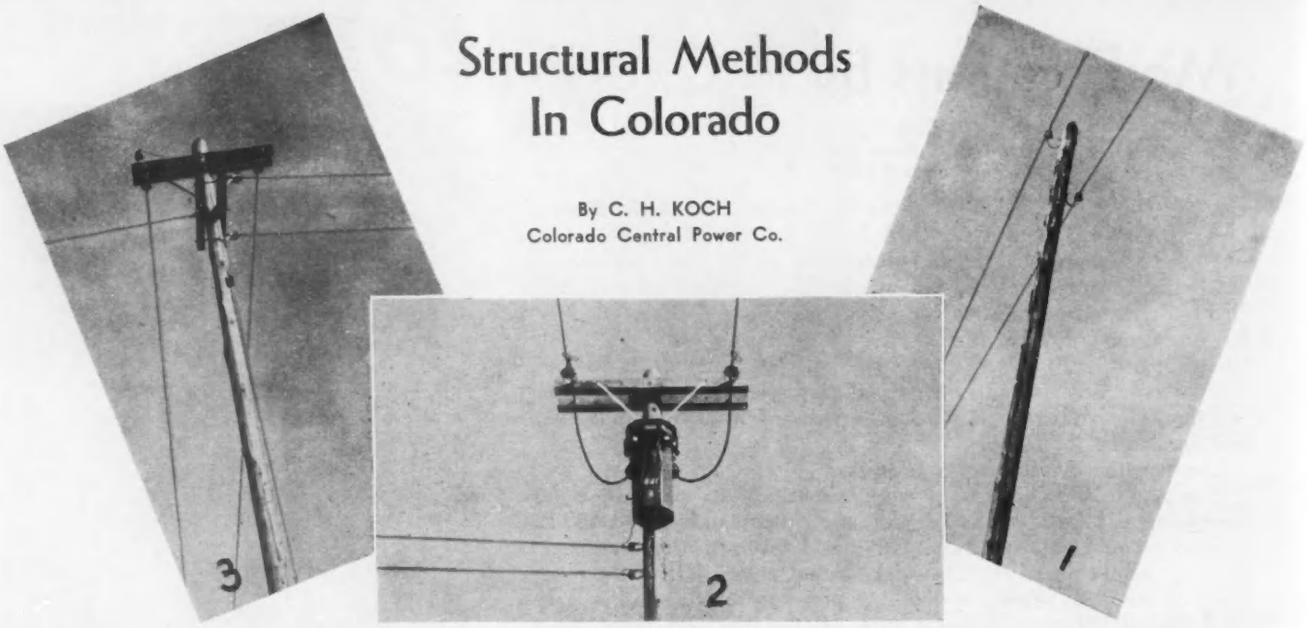




1. Single phase transformer installation framed for future three phase. 2. 11-kv. angle pole. 3. Transformer with secondary cutouts only 4. Transformer with secondary cutouts only and service rack. 5. Transformer and primary cutouts mounted on line arm. 6. 11-kv. dead end on single

Structural Methods In Colorado

By C. H. KOCH
Colorado Central Power Co.



RURAL line construction problems and methods in the Weld County area served by Colorado Central Power Co. are typical of almost any territory in Colorado with the exception of mountainous regions west of Denver. The terrain on one line might be hard gumbo, sandy, loamy or swampy, or a combination of all. It is seldom that a line is built that it isn't necessary to use a bail for digging holes in sandy or swampy land. Tree conditions, as a rule, are good, and in most cases any trees along the right-of-way are cut down, thus eliminating future expense for tree trimming. Where possible, a private right-of-way is obtained from the customers along the route at no cost except for recording. Although private right-of-way might involve higher labor and transportation costs, the probability of having to move a line due to road widening is remote.

One 6,900-volt, single-phase, delta rural line, 4½ mi. long, constructed in November 1936, involves all the types of terrain mentioned above and the construction is typical of all lines built by us in Weld County. Material cost per mile of line including secondaries, services and meters, but not including transformers, was $359.40. There is nothing charged to solicitation as it is never necessary to solicit customers on a line under 5 mi. in length. Insurance, stores expense, right-of-way and legal expenses and contingencies amounted to $201.69, or $44.82 per mi. Total labor and transportation expense was $434.32, or $96.52 per mi. Engineering costs are included in the labor costs. Total cost per mile of line of all material and labor excepting transformers was (labor for mounting transformers is included) $500.74.

The poles used were 76 30-ft., Class 6, western red cedar; 5 35-ft., Class 5, western red cedar, and 4 40-ft., Class 4, western red cedar, all penetrex butt treated. No. 6, medium hard drawn copper wire was used throughout. Bracket-type construction was used on straight lines as shown in Fig. 1, while crossarms were used for transformer stations, railroad crossings, over driveways, deadends and corners as in Fig. 3. Wesinghouse type CSP transformers, 6,900 to 115/230-volt, in 3- and 5-kva. sizes, were used mounted as in Fig. 2. Required for construction were 740.5 man-hr., 168 truck-hr.

Construction costs of other lines built are comparable to the above and the average number of customers per mile is 3.5 with monthly revenue ranging from $20 to $40 per mile.

On the east and west lines, the average span length is 250 ft., while that for the north and south line is 300 ft. The shorter east and west spans are due to prevailing winds during storms. No. 6, bare copper wire has proved satisfactory on these long spans by increasing sag.

This method of construction has been used for the last 2½ years with practically no operating trouble. Outages due to lightning have been practically eliminated by the use of CSP-type transformers. Interconnection of arresters and neutral grounds have been used in most cases where grounding conditions warranted.

During the last few months material and labor costs have increased approximately 20 per cent, thereby adding about $100 per mi. to the cost of single phase, 6,900-volt, delta rural line. The bracket type construction, besides being less expensive than crossarms, has the advantage of reducing necessary tree trimming. Vertical clearance between conductors is 24 in., one conductor being carried on each side of the pole as shown in Fig. 1. In some cases, where ground clearance is not so important, instead of crossarms for deadending on a corner, the skeleton-type corner is used, vertical clearance between conductors being 36 in.

Southern Colorado Power Builds 20 Miles of Line

By E. B. HORNBAKER
Southern Colorado Power Co.

APPROXIMATELY 20 miles of rural line have been constructed recently by the Southern Colorado Power Co., utilizing long spans and high strength conductors. About one-half has been constructed with spans averaging 350 ft. in length, utilizing No. 8A Copperweld conductor with 30-ft. 6-in. top poles installed 4½ ft. in the ground. Insulators used consist of two Knox No. 320W white porcelain spools or similar, installed with Joslyn J-2395 15-in. single spool brackets, or similar. Conductors were installed on either side of the pole with a vertical separation of 2 ft.

Similar construction has been used on an additional ten miles of rural line recently installed, except that No. 6A Copperweld conductor has been used with 35-ft. poles, provisions having been made for a future 13 kv. circuit on the same pole line. Poles have been installed with a minimum spacing of 400 ft., while spacings of 600 to 800 ft. have been used where contour permitted. Although these lines have been in service only a short time, no operating troubles of any description have been experienced.

Status of Rural Line Construction

DURING 1936 twenty-four electric utility companies serving the major portion of the rural areas in the Western states built 2,821 miles of rural lines costing $7,911,754 and serving 26,689 new customers. In the first six months of 1937 these same companies constructed 1,350 miles of rural lines, spent $4,087,206 on rural service facilities and connected 13,996 new rural customers. They estimate their complete 1937 programs to include 2,462 miles of new lines, with expenditures of $7,478,000 to serve 21,800 new customers. These figures are reported in detailed analyses made for ELECTRICAL WEST by the operating companies and shown in state totals in the accompanying table.

In 1936 one REA project involving 75 miles of line costing $89,750 and serving 420 customers was completed in this same region. At the present time there are REA projects under construction or for which bids have been called involving the construction of 1,708 miles of line with expenditures of $1,986,200 to serve 6,112 customers. REA projects for which loan contracts have been executed or allotments made total $3,705,000 and include 3,304 miles of line to serve 10,557 customers. Details on all of these projects are shown in the accompanying table which has been prepared from data submitted by the REA.

Operating utilities anticipate rural electrification programs for 1938 at least equal in size to those which will be completed this year. About half of the companies reported that it is too early to determine just what their plans will be while the other half stated that preliminary budget figures were based upon programs equivalent to those of 1936 and 1937.

From this information it is evident that the power companies have not been remiss in their obligation to serve rural customers in the major portion of the Far West. Most of the REA projects are in regions either remote from central station service or where the potential loads and revenues precluded rural extensions under the rules imposed by utilities and regulatory bodies.

Interesting sidelight on the rural electrification picture is the recent allotment of REA funds totaling $15,000,000 announced in an administrative order dated Sept. 3. This sum constitutes half of the total funds available to REA for the current fiscal year. Allotment was made on the basis of unserved farms. Western states fared as follows:

Arizona	$ 30,705
California	167,309
Colorado	140,814
Idaho	64,436
Montana	111,549
Nevada	5,780
New Mexico	100,487
Oregon	104,253
Utah	30,822
Washington	109,965
Wyoming	37,387

Data regarding served and unserved farms in this region is contradictory, probably due to variations in the definition of what constitutes a farm. In the case of California, for instance, the serving utilities report approximately 125,000 connected to their lines. REA has two figures on unserved California farms—70,996 as reported in the accompanying table and 63,797 as used in setting up the allotments reported above.

Still further details of the picture are painted by the Edison Electric Institute's recent nation-wide survey, which reveals that in spite of the increased connections made during the first six months of 1937, 20 per cent of farm homes in the U. S. accessible to electric power lines have not taken service.

The survey shows that occupied farms, within reasonable connecting distance of power distribution lines total 1,420,635. Of this number, 1,138,335 are using electric service. However, the total number connected represents only 17.5 per cent of all occupied farms and 25.8 per cent of all farms where the dwellings are valued at more than $500.

Breaking down results by regions and states, the survey shows further that in the three Pacific states 64.3 per cent of the 279,580 farms having occupied dwellings have electric service, and 77.5 per cent of the 231,989 farms having dwellings valued over $500 have electric service. These figures are higher than those for any other region. In the mountain states, 23.1 per cent of the farms with occupied dwellings and 34 per cent of the farms having dwellings valued over $500 have electric service.

California has the most complete rural electrification with 107,275 farms connected. However, from a percentage point of view, Rhode Island, with 90.6 per cent of all farms connected, leads the way.

Farm connections made during the first six months of the year were greatest in the Central States. In these 12 states 53,167 new customers were added. The Pacific States showed an addition of 7,246; the Mountain States, 3,306.

Rural Line Construction—11 Western States by Private Utilities

	1936	1937 (6 mo. actual)	1937 (Budget)
ARIZONA:			
Miles of line built	37.0	24.5	—
Customers added	359	255	—
Expenditures	$ 128,000	$ 95,700	—
CALIFORNIA:			
Miles of line built	1,396.9	609.2	1,305
Customers added	15,093	7,883	15,000
Expenditures	$5,148,689	$3,065,571	$5,800,000
COLORADO:			
Miles of line built	95.0	135.0	210
Customers added	570	675	1,075
Expenditures	$ 96,000	$ 162,000	$ 300,000
IDAHO:			
Miles of line built	225.0	106.0	140
Customers added	1,004	452	625
Expenditures	$ 260,000	$ 123,800	$ 253,000
NEVADA:			
Miles of line built	38.1	4.8	7
Customers added	32	—	—
Expenditures	$ 40,000	—	—
OREGON-WASHINGTON:			
Miles of line built	929.0	470.6	840
Customers added	5,631	2,731	5,100
Expenditures	$2,239,065	$ 640,135	$1,125,000
UTAH:			
Miles of line built	129.8	81	110
Customers added	751	385	330
Expenditures	$ 123,689	$ 81,691	$ 100,000

Farms Receiving Electric Service—As of June 30
(Edison Electric Institute Survey)

STATE	Farms Having Occupied Dwellings (A)	Farms Having Dwellings Valued Over $500 (B)	Farms Having Electric Service (C)	Increase First 6 Months 1937	Per Cent Electrification C/A Per Cent	C/B Per Cent
Montana	47,204	28,492	3,703	91	7.8	13.0
Idaho	43,037	31,897	20,555	1,679	47.8	64.4
Wyoming	16,963	10,774	1,547	14	9.1	14.4
Colorado	61,653	43,603	9,264	559	15.0	21.2
New Mexico	38,881	20,903	2,071	71	5.3	9.9
Arizona	18,344	13,263	6,475	66	35.3	48.8
Utah	27,362	22,501	14,365	826	52.5	63.8
Nevada	3,432	2,582	1,271	0	37.0	49.2
Mountain	256,876	174,015	59,251	3,306	23.1	34.0
Washington	82,379	67,032	45,685	3,537	55.5	68.2
Oregon	62,332	50,329	26,916	1,063	43.2	53.5
California	134,869	114,628	107,275	2,646	79.5	93.6
Pacific	279,580	231,989	179,876	7,246	64.3	77.5

REA-Financed Projects in Eleven Western States

(As of Aug. 24)
Data From REA

Arizona

(On July 1, 12,788 farms were without electric service. Total allotments for projects since REA was organized—$145,000.)

PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
Pinal	San Carlos Irrigation & Drainage District, Florence	$145,000	124	509	Indian Irrigation Service	Invitation to bid

California

(On July 1, 70,996 farms were without electric service. Total allotments for projects since REA was organized—$1,483,000.)

PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
Modoc	Surprise Valley Elec. Corp., Alturas	$500,000	344	809	Generating plant	Under construction
Imperial	Imperial Irrigation District, El Centro	700,000	700	2,100	Imperial Irrigation District	Loan contract executed
Plumas	Plumas-Sierra Rural Elec. Coop., Blairsden	283,000	234	643	Generating plant	Under construction

Colorado

(On July 1, 54,801 farms were without electric service. Total allotments for projects since REA was organized—$740,000.)

PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
Mesa	Grand Valley Rural Power Lines, Inc., Grand Junction	$140,000	139	639	Public Service Co. of Colo.	Under construction
Morgan	Morgan County Rural Elec. Assn., Fort Morgan	250,000	248	644	Not determined	Loan contract executed
Mesa	Grand Valley Rural Power Lines, Inc., Grand Junction	25,000	24	92	Not determined	Allotment approved
Alamosa	San Luis Valley Rural Elec. Co., Monte Vista	150,000*	345	800	Not determined	Allotment approved
Prowers	Cooperative being formed	175,000	165	480	Not determined	Allotment approved

*Partial

Idaho

(On July 1, 30,377 farms were without electric service. Total allotments for projects since REA was organized—$683,750.)

PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
4-Bonner	Northern Idaho Rural Elec. Rehab. Assn., Inc., Sandpoint	$ 54,000	40	248	Mountain States Power Co.	Completed
6-Bonner	Northern Idaho Rural Elec. Rehab. Assn., Inc., Sandpoint	35,750	35	72	Mountain States Power Co.	Completed
4B-Bonner	Northern Idaho Rural Elec. Rehab. Assn., Inc., Sandpoint	119,000	103.5	445	Mountain States Power Co.	Under construction
Nez Perce	Clearwater Valley Light & Power Assn., Inc., Lewiston	475,000*	300	900	Generating plant	Loan contract executed

Montana

(On July 1, 46,721 farms were without electric service. Total allotments for projects since REA was organized—$715,600.)

PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
Sanders	Clarks Fork Power Assn., Thompson Falls	$ 85,000	60	260	Montana Power Co.	Under construction
Madison	Jefferson Valley Rural Elec. Coop., Inc., Whitehall	50,000	49	176	Montana Power Co.	Under construction
Ravalli	Ravalli County Coop. Elec. Assn., Corvallis	125,000	125	400	Montana Power Co.	Under construction
Cascade	Sun River Electrification Assn., Sims	100,000	106	345	Montana Power Co.	Under construction
Richland	Lower Yellowstone Rural Elec. Assn., Sidney	115,000	110	328	Montana Power Co.	Under construction
Missoula	Missoula County Elec. Assn., Missoula	77,000	73	326	Montana Power Co.	Under construction
Yellowstone	Yellowstone Valley Elec. Assn., Huntley	155,000	135	549	Montana Power Co.	Under construction
Ravalli	Ravalli County Coop. Elec. Assn., Corvallis	8,600	(wiring & plumbing)		Montana Power Co.	Loan contract executed

Nevada

(Until this time no allotments have been made by REA to Nevada.)

PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
Clark	Cooperative being formed	$178,000	94	428	Boulder Dam	Allotment approved

New Mexico

(On July 1, 39,790 farms were without electric service. Total allotments for projects since REA was organized—$164,000.)

PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
Eddy	Central Valley Rural Coop. Elec. Co., Artesia	$164,000*	84	134	Generating plant	Allotment approved

Oregon

(On July 1, 45,375 farms were without electric service. Total allotments for projects since REA was organized—$402,000.)

PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
Clatsop	Nehalem Valley Coop. Elec. Assn., Jewell	$ 65,000	54	276	Not decided	Under construction
Lane	Blachly Lane County Coop. Elec. Assn., Blachly	108,000*	87	420	Generating plant	Under construction
Umatilla	Umatilla Elec. Coop., Hermiston	129,000	120	492	Not decided	Loan contract executed
Multnomah	Portland General Electric Co., Portland	100,000	109	573	Present system of borrowers	Allotment approved**

** Action suspended until additional investigations are completed.

Washington

(On July 1, 43,773 farms were without electric service. Total allotments for projects since REA was organized—$844,200.)

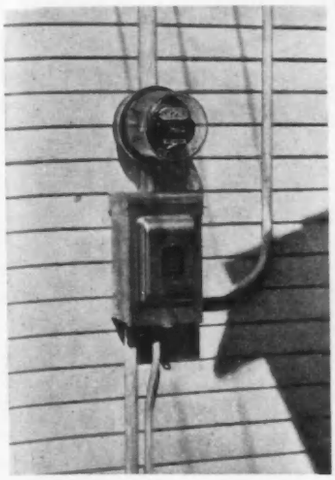
PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
King	Mutual Power & Light Assn. of Tanner, North Bend	$ 19,200	13	38	City of Seattle	Under construction
Spokane	Inland Empire Rural Elec., Inc., St. John	545,000*	463	1,530	Generating plant	Loan contract executed
Benton	Benton Rural Elec. Assn., Benton City	45,000	43	150	Not decided	Loan contract executed
San Juan	Orcas Power & Light Co., East Sound	87,000	70	200	Generating plant	Loan contract executed
Grays Harbor	Quinault Light Co., Quinault	60,000	23	150	Generating plant	Loan contract executed
Cowlitz	Public Utility District No. 1 of Cowlitz County, Kelso	88,000	81	305	Not decided	Loan contract executed

Wyoming

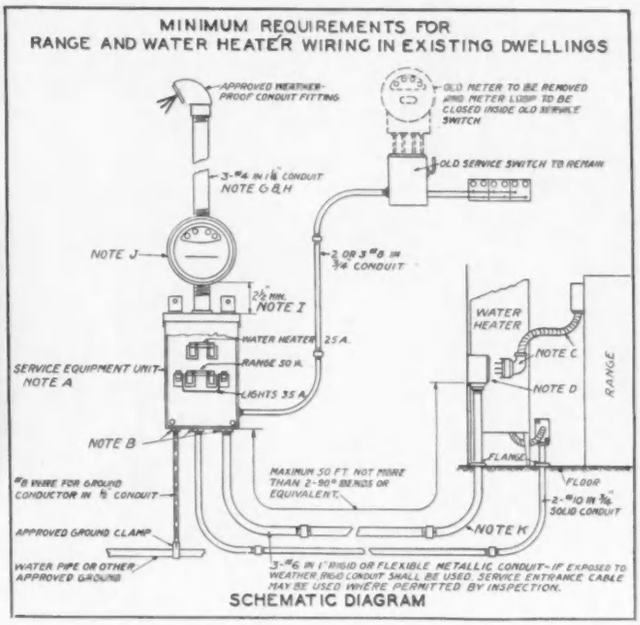
(On July 1, 15,782 farms were without electric service. Total allotments for projects since REA was organized—$610,000.)

PROJECT	SPONSOR	AMOUNT	MILES	CUSTOMERS	SOURCE OF POWER	STATUS
Goshen	Wyrulec Co., Lingle	$ 62,000	54	163	Bureau of Reclamation	Under construction
Platte	Wheatland Rural Electric Assn., Wheatland	65,000	62	220	City of Wheatland	Under construction
Park	Garland Light & Power Co., Garland	50,000	50	190	Not decided	Under construction
Lincoln	Lower Valley Power & Light, Inc., Freedom	145,000*	90	618	Generating plant	Loan contract executed
Big Horn	Big Horn Rural Electric Co., Basin	82,000	85	300	Mountain States Power Co.	Loan contract executed
Washakie	Washakie Rural Electric Co., Worland	50,000	50	154	Not decided	Loan contract executed
Goshen	Wyrulec Co., Lingle	156,000	150	392	Bureau of Reclamation	Allotment approved

* Includes generating plant.



Installation of one of Southern California Edison's new multi-breaker service entrance units


MINIMUM REQUIREMENTS FOR
RANGE AND WATER HEATER WIRING IN EXISTING DWELLINGS
APPROVED WEATHER-PROOF CONDUIT FITTING
OLD METER TO BE REMOVED AND METER LOOP TO BE CLOSED INSIDE OLD SERVICE SWITCH
OLD SERVICE SWITCH TO REMAIN
3-#6 IN 1½" CONDUIT NOTE G & H
NOTE J
3 OR 3 #8 IN ¾" CONDUIT
2½" MIN. NOTE I
WATER HEATER 25 A.
RANGE 50 A.
LIGHTS 35 A.
SERVICE EQUIPMENT UNIT NOTE A
NOTE B
WATER HEATER
NOTE C
NOTE D
RANGE
FLANGE
FLOOR
2-#10 IN ¾" SOLID CONDUIT
#8 WIRE FOR GROUND CONDUCTOR IN ½" CONDUIT
APPROVED GROUND CLAMP
WATER PIPE OR OTHER APPROVED GROUND
MAXIMUM 50 FT. NOT MORE THAN 2-90° BENDS OR EQUIVALENT.
NOTE K
3-#6 IN 1" RIGID OR FLEXIBLE METALLIC CONDUIT—IF EXPOSED TO WEATHER RIGID CONDUIT SHALL BE USED. SERVICE ENTRANCE CABLE MAY BE USED WHERE PERMITTED BY INSPECTION.
SCHEMATIC DIAGRAM

Old type service entrance unit which was replaced by the new multi-breaker facility

Service entrance facilities are simplified by Southern California Edison's

New Multi-Breaker Assembly

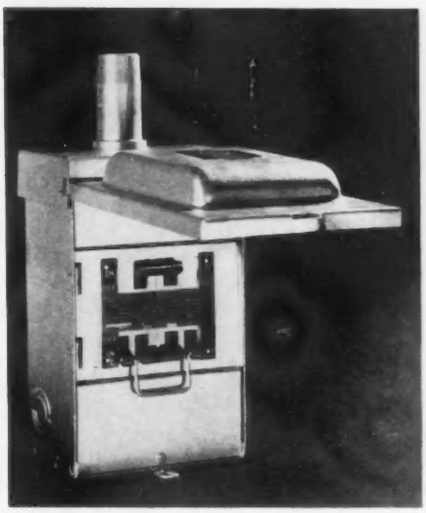
WHEN 54 new multi-breaker service entrance facilities were installed during August by Southern California Edison Co., Ltd., requests were made to all inspectors, wiremen and customers for expression of opinion concerning the units. The requests were answered. Practically all comments were favorable. And so was indicated extensive use of the units by the company, widespread acceptance by other companies.

"Standardization was the purpose of adopting the new unit," H. C. Rice, merchandise manager for the company, said. "The Edison Company lets the wiring contract and supplies this service equipment to the contractor, thus making certain that service requirements are met at all times. This unit is especially adaptable to our plan of sequence metering."

Manufactured by the Square D Co., the unit is designed to control range and water heater circuits and to protect the lighting distribution panel. Principal features are proper circuit protection and size.

Fuses are eliminated and possibility of a circuit being over-fused or rendered unprotected by bridging of fuses is avoided. Full capacity of all installed wiring may be used.

Size, affecting appearance, was cut to a minimum. "This was important," Mr. Rice said, "because in a large majority of instances, new range and water heater wiring goes into an existing dwelling, which means that installation is made in the exterior of the house. The new unit is compact—6½ by 9 in., as compared with the 1935 unit's 17½ by 21¼ in.—has no protruding parts and generally is trim in appearance."



Close-up of the new unit, showing arrangement of switches

Other features are numerous. The unit is tamper-proof and weather-proof, being equipped with screw type fitting on top for service conduit and knockouts on sides and bottom for load conduits. It has a 50 amp. range switch, 35 amp. lighting switch and 25 amp. water heater switch. All settings correspond to wire size ratings. Main body of the unit is hinged to the side of the housing so that it may be swung out of the way while wires are being drawn through the connecting conduit, then swung back into position for connection.

Use of the unit is the latest step in the Edison company's program for simplification and standardization of service entrance requirements. In August 1935, the company adopted a unit with four externally operated knife switches, a 100 amp. main switch, 60 amp. range switch, 60 amp. lighting switch and 30 amp. water heater switch. About 2500 were installed. In April 1936, this model was succeeded by 6000 improved pull-out switch type units whose dead-front construction concealed live parts.

Costs were kept down and shopping made easier when Buffum's Department Store

Modernized With Light

A GOOD example of the improvement which can be effected in a store building by modern lighting is Buffum's Department Store in Long Beach, Calif. Totaling results of the recent modernization project, H. C. Barnard, illuminating engineer for F. J. Airey Co., Inc., says: "Buffum's has shown faith in itself and its entire clientele, which can now shop in a modern up-to-date store with ease and comfort. Merchandise has taken on a new appearance: it is better displayed and easier to find. Service has improved, the employees having increased faith in their future as well as in their employers."

The program was undertaken only after careful consideration of procedure. Experiments made in the basement dress goods section conclusively proved that the method proposed by Architect Horace Austin, authorized by Owner Harry Buffum and carried out by Building Superintendent J. H. Johnson with the assistance of Maintenance Engineer Ted Phillips was correct. This method served two purposes: First, it made it more comfortable for the customer to shop; second, it kept down costs.

Considerable planning and redesigning were involved in the work. It was also necessary to suspend from the ceiling and continue around the entire second and third floors a specially constructed cove, object of which was to furnish a soft, efficient light as well as to illuminate movable letters used for directional signs.

This cove, finished in white within, a neutral tone without, was constructed of wood with metal suspension rods. So that the light might be properly controlled, a continuous line of lumiline lamps, each set in a directional reflector, was run around the inside. Glass panels finished the bottom of the cove and removed the appearance of too great solidity.

On the third floor a glass column, part mirrors and part flashed opal glass, was built around one of the building's supporting columns. Directional reflectors and lumiline lamps placed behind the opal glass supplied the illumination.

This is how Buffums looked after its lighting system was improved and modernized. Wiremold directional reflectors plus lumiline lamps were set behind signs and over glass panels in suspended coves to give the effect achieved both at right and below. Duplicate equipment was used in the rear display case at right and in the ceiling over recessed shelves below

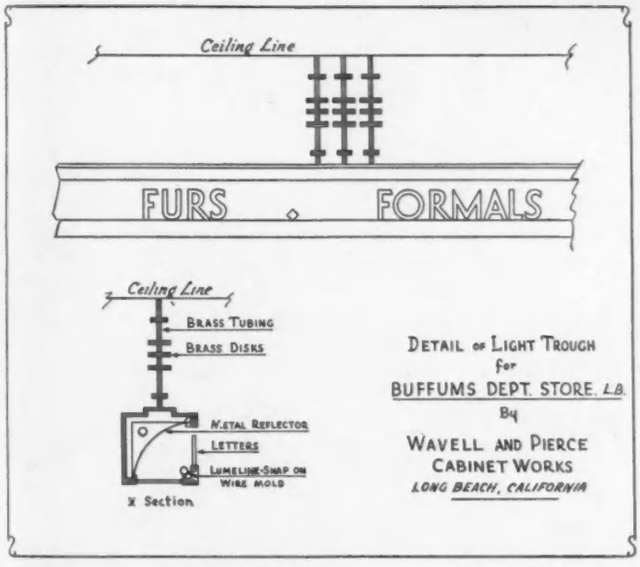
Two other features of these floors are semi-circular display cases and, on the second floor, recessed display cases. Lighted by more directional reflectors and lumiline lamps, these cases now show merchandise so clearly that it may be easily distinguished from the center aisles.

On the first floor an area was set aside for women's shoes. Directional reflectors and lumiline lamps are used here in coves both inside and outside the area and also in small recessed cases. Again the lighting brings out details of the display and acts as a zone of attraction.

The mechanics of the layout required much detailed work. Before anything could be started, electric outlets had to be placed at given locations and a new service line run from the sub-basement to the distribution panel on the second floor in order to take care of the additional energy plus what was available

in unused circuits. This run was 168 ft. of 1¾ in. galvanized conduit with six No. 1 wires. From the distribution panel wires were then carried in a Wiremold metal raceway, 1 11/32 by 1 1/32 in., set on the surface and following in turn through the entire length of the suspended coves. On this raceway were set the directional reflectors, each with its own lamp.

Only materials of standard make were used, thus cutting costs. They included: In the basement—97 30-watt lumiline lamps with 97 Wiremold directional reflectors and fittings; 160 ft. of metal raceway. In the shoe department on the first floor— 170 30-watt lumiline lamps with 170 directional reflectors and fittings; 320 ft. of metal raceway. On the second and third floors—1,113 30-watt lumiline lamps and 105 40-watt lumiline lamps with 1,218 directional reflectors and fittings; 1,990 ft. of metal raceway.



The diagram at the left shows details of the light troughs used in Buffums. Above is pictured the actual result. Wiremold directional reflectors set in Wiremold raceway with lumiline lamps were used in the suspended coves all the way around the second and third floors. Similar equipment was used in the columns and perpendicularly behind the outer columns of the wall display cases

California Department Issues School Handbook on Sight

A new handbook for teachers and school executives entitled "An Introduction to the Problems of Sight Conservation" has just come off the presses of the State of California as a Department of Education Bulletin. Edited by R. S. French, principal of the California School for the Blind and the president of the Sight Conservation Council of Northern California, the book is designed to give to teachers and school executives the fundamental knowledge necessary for an appreciation of sight conservation and proper lighting.

Speaking of the reliability of trade literature on the subject of lighting, in his preface Dr. French says, "The technical publications of other national organizations interested in sight conservation and the effective utilization of sight are for the greater part reliable. The reader who wishes to investigate must, of course, use discrimination where such secondary problems as that of salesmanship "enter the picture." Increased sales neither justify nor condemn such a movement as that for sight conservation, though increased sales as a part of richer and more comfortable human living surely cannot be held anathema just because of commercial connection. Genuine service to humanity and to the progress of science is not incompatible with business success. In trying to find, then, some quotient of reliability in commercial publications one can only apply what are good tests of reliability in other connections and make up one's own mind on one's own findings. In no case is human welfare, more particularly child welfare, to be sacrificed to any motive, even the most scientific.

"In this connection the writer would like to stress the need of 'common ground' for all vitally interested persons. For one group of scientifically trained persons to condemn or to seek to discredit another group is to invite public distrust. In this time of confusion with many quacks offering panaceas not only must the scientifically trained stand for correct procedure more than ever but men and women of enlightenment must stand together in good will and present a solid front both for human welfare and against all evil practices wherever found."

At the same time that Dr. French's book appeared the Sight Conservation Council of Northern California issued its first annual report. In it are listed the preliminary meetings, the choice of Board of Directors and officers, the activities undertaken, the accomplishments of the association. Particularly interesting is the Report of the Science of Seeing Conferences held at San Francisco State College in July, 1936 under the auspices of the Council. A second series was held between February and April, 1937 with like results. The latter publication is a report of the executive secretary, Clark Baker.

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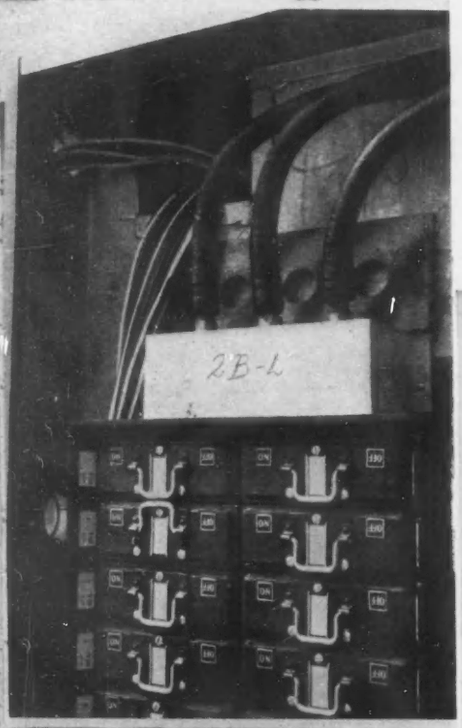
THE NEW ELECTRIC CODE of Washington State gives state inspectors superior power to city electrical engineers, Attorney-General G. W. Hamilton last month informed City Attorney W. A. Beakley of Bremerton. State inspectors have final word in approving or disapproving electrical installations or extensions, he said, in the interests of uniformity.

Flexible Submetering in Furnitur Excha

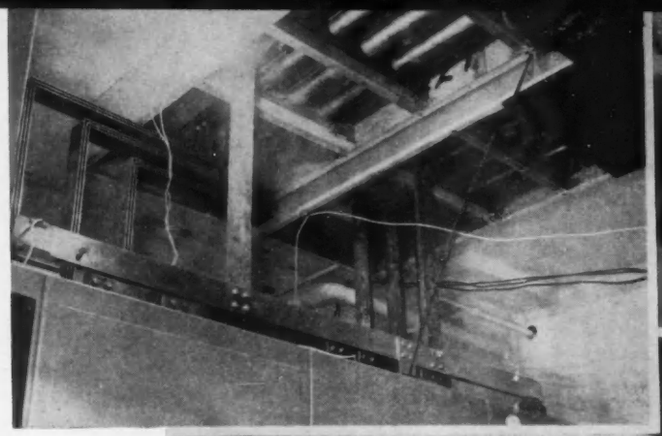
Large building, many tenants, each with different display requirements and load demands, such is the new Western Furniture Mart, San Francisco. Engineers Leland & Haley, and Alta Electric & Mechanical Co., contractors, provided it with a bare bus distribution system and flexible metering arrangement adaptable to any and all demands and conditions. Capacity of 7½ watts per square ft. of floor space is available, each bay 20 x 20 ft. being supplied by two 1,500-watt circuits to be used as the tenant sees fit with his own wiring installation.

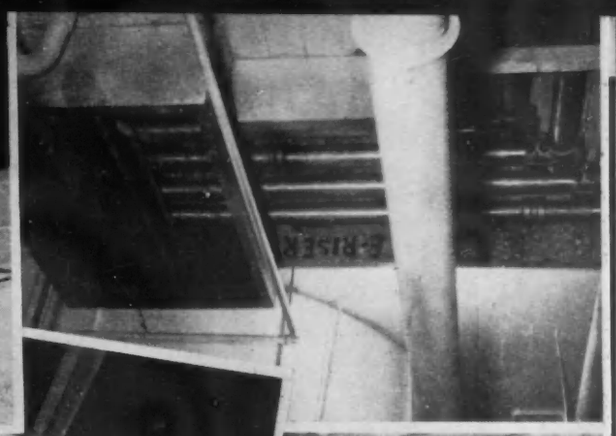
The fourth floor is equipped with a multi-wave antennaplex system for radio display demonstrations which will be described in another article. Special lighting applications in various exhibitors spaces will also be described in later articles.

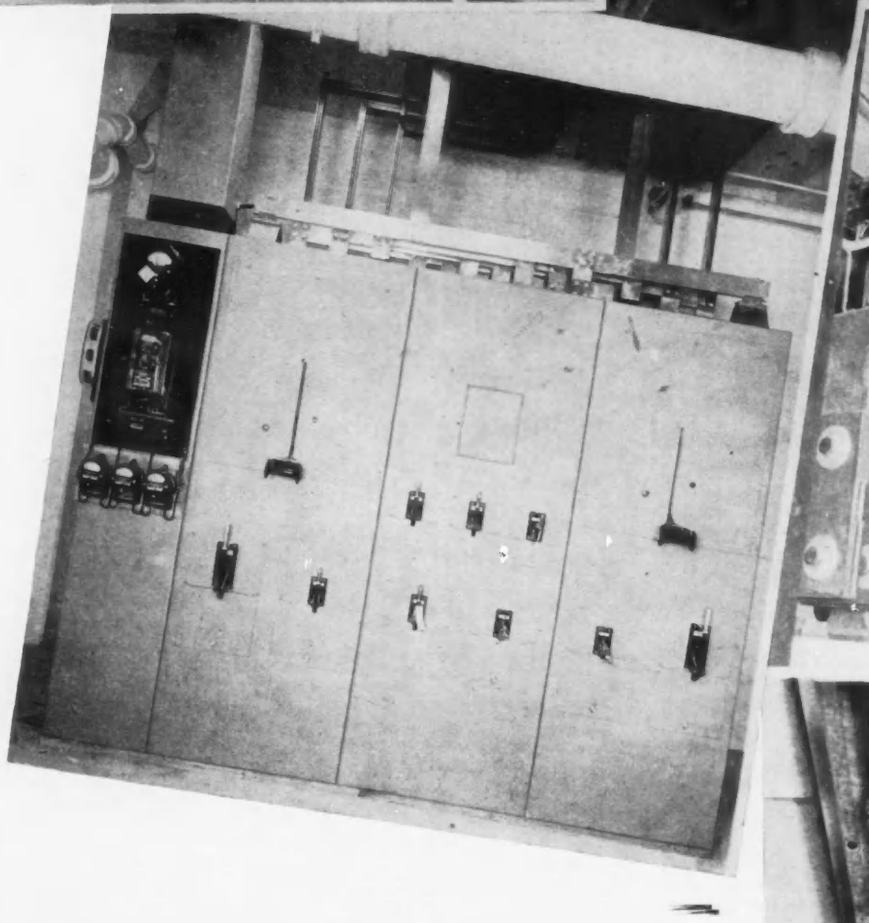


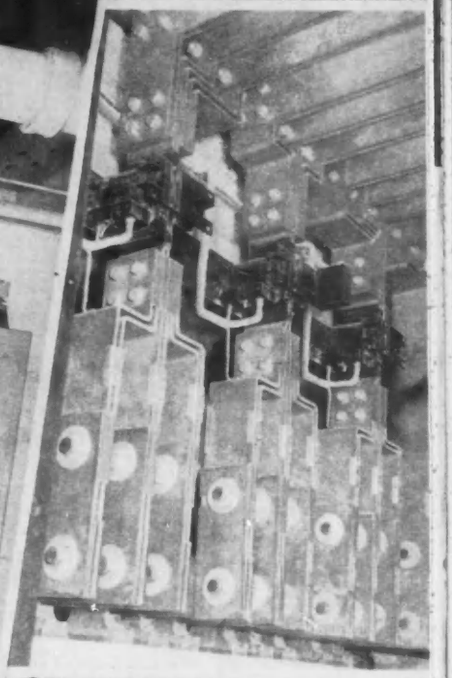
Left, top: Four 3½" o.d. extra heavy copper pipes form the two riser systems, one on each side of the elevators. Metal sides, masonry back, and ebonite front make up the riser shaft. Ebonite separators hold the pipes firm, yet permit expansion. Ebonite fire stops box off each floor level. Double lugs, staggered, tap off to the plug-in meter disconnect panels on each side of the riser shaft. Center: Top of one of the meter disconnect cabinets, with three hot leads coming in from the riser taps into the top. A sheet metal guard (with the letters 2B-L) protects the lugs from personal contact. The ebonite strip drilled with three holes fits over the top. Meter gutters are at extreme left. The hole at the top opens to a gutter in back of the risers connecting between both sides of the riser so that circuits can be run from any given meter to connect to any bay

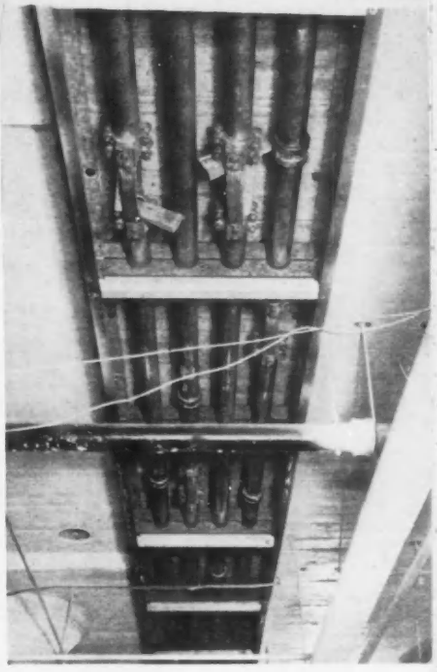
Below: Completed metering layout in one of two metering rooms on each floor. Riser sh closed, in the center. Meter disconnect panels each side, with meters mounted on gutters. cuit disconnect and fusing panels at each end nearest one opened. Below, in the corner of page, is the layout while under construction, sh ing gutters, panels, and riser shaft opened. E tenant is separately metered, and can comb any bay or number of bays on one meter. Th are 256 1500-watt circuits on No. 12 wire serv the 128 20 x 20 ft. bays on each floor. Corri lights are separately controlled from locked p els located in the corridors











A small main switchboard is possible with this type of distribution. Above is the Trumbull main switchboard in the basement, abutting the Pacific Gas and Electric Co. transformer vault in the alley at the rear. Service comes in from one bank of three 100 kva. transformers and one bank of three 150 kva. transformers into a flat bar 6000 amp. header bus, (shown in center picture, right of page). Three series 2000/5-amp. current transformers for metering are mounted on the header bus. The header bus is split at this switchboard into two 3000-amp. 4-wire sub-buses, each controlled by a 3000-amp. carbon air breaker. Auxiliary basement power is also disconnected at this board. From here the two copper pipe bus systems (shown terminating above the board in the top left picture) are fed from flat bar bus through holes cut in the ebonite cover of the bus trough. Copper pipe buses extend along the basement ceiling (see lower right hand picture) in the bus trough, supported on split ebonite separators resting on hard dry maple cross supports on the bottom of the trough. Expansion joints are used on the horizontal runs to permit expansion

Horizontal runs of the bus on the basement ceiling terminate at the base of each vertical riser shaft (as seen in upper right corner). The vertical risers rest on a saddle of heavy steel on which are mounted insulated cups or fittings. Elevator power is taken from the top of each bus riser to the set of three elevators nearest that riser, through a sub-panel which also feeds the blower motors and miscellaneous power for the shops on the roof floor. Thus each bank of elevators is individually served, providing greater assurance of uninterrupted service

Lighting, except in the display spaces of Westinghouse and Graybar, which use their own fixtures, is done with Ivanhoe Helmet luminous bowl indirect fixtures, 200-watt in corridors, 500-watt in general display areas, 750- or 1000-watt in high ceiling spaces. Lighting circuits terminate in three outlets in the ceiling of each bay, arranged diagonally between pillars. One lighting unit per bay is equipped with a fixture by the Mart, tenants installing additional units as they desire

Tom Bennett, chief electrical estimator, and Grover Stuart, superintendent for Alta Electric & Mechanical Co., developed many of the design details on this job

PRINT IN BINDING

News of the Industry

SACRAMENTO BOND ISSUE UPHELD BY U.S. COURT

Sacramento Municipal Utility District's right to issue $12,000,000 in bonds to build a power plant and distribution system was upheld last month by the U. S. Circuit Court of Appeals. Pacific Gas & Electric Co. had appealed on grounds the district is not a government agency, hence has no tax power, and that taxing company property to construct a competing industry is unfair.

Held to be legal was the district's power to tax. Emphasized was the court's opinion that the service of furnishing electric energy was "as interwoven in the lives of California men and women" as the function of supplying them with water.

Still open to the company is the possibility of appealing to the Supreme Court. Still undecided by the district is whether action would involve duplicating or condemning the company's system.

IDAHO POWER CO., Boise, last month filed a registration statement under the Securities Act of 1933 covering $18,000,000 of first mortgage 3¾ per cent bonds due Oct. 1, 1967. According to the statement, net proceeds from the sale will be applied on the redemption of a previous issue of first mortgage bonds, repayment of unsecured advances made to the company by Power Securities Corp., and reimbursement of the company's treasury in part for expenditures made in constructing or improving facilities.

UTAH P. & L. MODERNIZES GREEN RIVER PLANT

Installation of another 500-kw. steam turbine generating unit and a new steam boiler together with general improvement of buildings and present equipment are included in the $30,000 modernization program under way at Utah Power & Light Co.'s plant in southeastern Green River, Wyo. The work will require three or four months to complete, according to J. H. Jacobucci, plant manager.

The new unit, replacing two steam engine generators, will supplement the present turbo-generator, doubling plant capacity for peaking.

REPUBLIC LIGHT & POWER CO. of Republic, Wash., has started surveys for a proposed mile-long power line from its Knob Hill substation to the Mountain Lion mine.

REDWOOD CITY, Calif., is scheduled to vote Nov. 2 on a proposal to issue $575,000 in general obligation bonds to purchase distribution facilities of the Pacific Gas & Electric Co. there. The measure, which requires a two-thirds majority to pass, proposes purchase of energy from the P.G. & E. The $575,000 represents the California Railroad Commission's $488,000 valuation, plus $37,000 for subsequent improvements and $50,000 for operating capital and miscellaneous costs.

FIRST UNIT AT BONNEVILLE DAM, the 4,000-kw. house generator, was turned over Sept. 15. The initial two main units will not be ready for operation until next year.

WASHINGTON COUNTIES SEEK TO KILL UTILITIES

Public utility power districts in nine Washington Counties last month filed 1938 budgets seeking to levy a 2-mill tax, proceeds to be used mostly to pay fees to hired help for studying possible condemnation proceedings. A tenth county, Pend Oreille, was less impatient to place a new tax burden on its constituents.

"We feel it would be extremely unwise," said V. P. Campbell, chairman for the group, "for Pend Oreille County to condemn any existing electric facilities.

"We feel the best way to be in a position to benefit from cheap power to be developed at Coulee Dam or elsewhere is for the county to be free of debt and ready to consider some well-planned and feasible program."

Meanwhile the other districts (nearly all of which happen to have contracted with the same law firm) were scheduling hearings on the proposed tax, while the legal counsel cleverly announced the program as "the most extensive public power development of its kind in the United States."

Only Pend Oreille County seemed to take stock of costs. Said its spokesman: "With the extreme problem of distribution, due to our scattered population, it will take a heavy subsidy of some sort to make it possible to reach all of the rural sections with electricity. We will not spend one unnecessary penny . . ."

Other counties involved are Whatcom, Lewis, Cowlitz, Pacific, Chelan, Kittitas, Lincoln, Douglas and Okanogan.

NEWLY ORGANIZED Quinault Electric Co. of Hoquiam, Wash., has been granted a 50-year franchise for power lines along roads in the Quinault district.

ATTEMPTS TO INTERRUPT POWER SUPPLY FAIL

Labor trouble arising as the result of a strike called by a CIO affiliate was given by Riverside County, Calif., deputy sheriffs as a cause of last month's attempts to interrupt the power supply to the San Jacinto tunnel pumps and machinery. On two different occasions, Sept. 14 and 15, one pole of a two-pole tower on the 66,000-volt line near Colton was demolished by dynamite. In neither case, however, was the attempt successful.

According to J. L. Burkholder, assistant general manager of the Metropolitan Water District of southern California, the Sept. 15 dynamiting was the third attempt to interrupt the service. On Sept. 10 a chain was thrown across two high voltage lines, thereby causing a short circuit which blew out the transformer bank and stopped power service at the Potrero shaft of the tunnel for an hour and a half.

To prevent any further efforts of the same kind, day and night patrol service has been established. Meanwhile the sheriff's office is investigating the cases.

MOUNTAIN STATES POWER TO CURTAIL SERVICE

Despite the fact light rains in Montana early last month brought hope of some relief from water shortage, the Mountain States Power Co. announced Sept. 21, that for the first time in its history service would be curtailed. Water in Swan Lake, above its Big Fork plant, is at the lowest level in history.

Manager H. M. Edmonds said service will be discontinued daily from 12:30 a.m. to 5 a.m., at Kalispell, Whitefish, Columbia Falls and Big Fork. Assistance from the Great Northern steam plant and Somers Lumber Co. will not carry the peak. A line is being run to Montana Power Co., but completion is not expected until late this month.

VANCOUVER, B. C., is considering proposals to install sodium-vapor lighting on the Granville and Cambie St. bridges, both of which have been scenes of several fatal accidents.

A NEW ONE-YEAR AGREEMENT concerning wages, hours and working conditions for about 1,700 employees of the Puget Sound Power & Light Company, went into effect last month. The agreement, covering the state-wide operations of the company, is the third made between union and company.

A.I.E. DISCUSSES FEDERAL POWER DEVELOPMENT

Although the 257 delegates to the Pacific Coast convention of the American Institute of Electrical Engineers, gathered in Spokane, Aug. 31 to Sept. 3, did not visit Grand Coulee dam until the last day of their meeting, the influence of big, new sources of power was evident from the opening session, when Dean H. V. Carpenter, State College of Washington presented his paper on proposals for administering Bonneville.

O. B. Coldwell, vice-president of Portland General Electric Co., raised the question of what a private utility should do in the face of such a project. His company, he said, hoped to coordinate its interests with those of the project and in accordance with this, was attempting, as rapidly as possible, to build customer-use in order to offer the government a load. He predicted a gradual adjustment to the new power source, eventuating in unified generation, coordinated transmission and local distribution over existing facilities.

C. R. Mason, General Electric Co., Schenectady, opened the first day's discussion of equipment, amplifying his paper, "Relay Operation During System Oscillations." He pointed out that demands for protective equipment on transmission systems in Southern California have carried developments to the point where carrier-current pilot-control will permit relays to operate on a fault even when they are being held inoperative to a system oscillation.

L. F. Hunt, Southern California Edison Co., Ltd., cited certain advantages gained through omitting three-phase pilot protection.

J. C. Albert, Los Angeles Bureau of Power & Light, asked what work was being done to prevent d.c.-transients' causing relay operation. Mr. Mason said induction relays offered a partial solution, that present research rests largely on tests recently completed at TVA.

J. P. Jollyman, Pacific Gas & Electric Co., summed up the discussion with the observation that improvement in the means of effecting high-speed reclosures might eventually lead to the possibility of offering uninterrupted service over single-circuit transmission lines.

A. C. Schwager, Pacific Electric Manufacturing Corp., and P. B. Garrett, speaking for R. C. Van Sickle, both of Westinghouse, discussed circuit breakers. Referring to multi-gap breakers, Mr. Schwager pointed out that the voltage gradient across any one pair of contacts is not uniform. He suggested the possibility of applying capacitance control to distribute the gradient across a single gap, similar to the manner in which Mr. Garrett described its use to distribute the voltage across several gaps.

During the discussion of power transmission and distribution, Prof. F. O. McMillan, Oregon State College, announced that recent tests there have definitely proven that negative corona will cause radio interference. Mr. Jollyman pointed out that for most lines corona does not cause interference to enough standard radio receivers to warrant special conductors for its reduction.

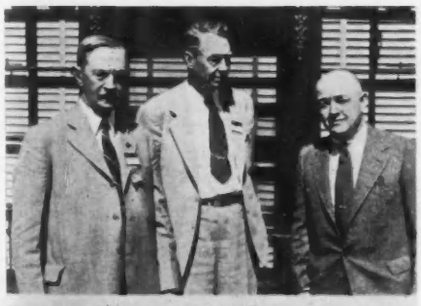
Electric house heating papers were presented by Dean Carpenter and Dr. C. E. Magnusson, U. of Washington. In answer to Dr. Magnusson's conclusions, envisioning the possibility of mass use of electric space heating, E. F. Pearson, Northwestern Electric Co., said Portland studies indicated cost of distribution (7 mills per kw.-hr.) and carrying charges on the consumer's equipment (about $50 per year) would prohibit its general use. He emphasized that his company wants all the heating load it can get.

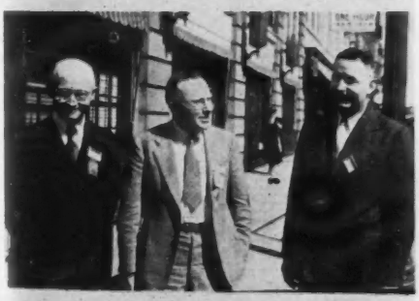
Mr. Coldwell pointed out that the public in the Northwest has been lead to expect electric heating and to think that any utility's statement of its cost is an attempt to mislead. He recommended a gradual approach by means of auxiliary heating.

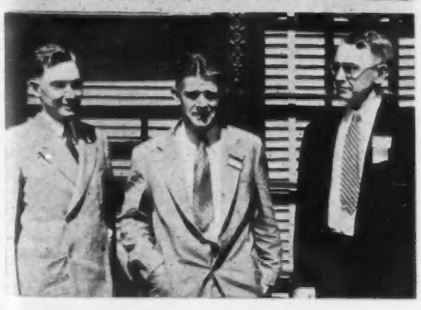
Two national officers attended the western meeting. W. H. Harrison, president, and H. H. Henline, secretary. Dean Carpenter was convention chairman.

Last day was devoted to golf, at which Prof. R. H. Dearborne, Oregon State, won the J. B. Fisken trophy, after a tie with Charlie Cutter, Pacific Electric Mfg. Co., and to the banquet, at which J. E. E. Royer, Washington Water Power Co., was toastmaster.

Many of the A.I.E.E. meetings were by twos and threes, ex-officio and non-technical. Left to right are: A. C. Schwager, Pacific Electric Mfg. Co., San Francisco, and O. B. Coldwell, Portland General Electric Co.; at Grand Coulee Dam are C. E. Rogers, Pacific Tel. & Tel. Co., Seattle, district vice-president of A.I.E.E., and A. F. Darland, U. S. Bureau of Reclamation; pausing during golf tournament are Dean H. V. Carpenter, Washington State College, the convention chairman, and Mr. Rogers







Top left to right: J. B. Fiskin, Washington Water Power Co.; H. H. Schoolfield, Pacific Power & Light Co.; and H. L. Melvin, Ebasco Services. Center: J. P. Jollyman, A.I.E.E district vice-president, Pacific Gas & Electric Co.; Dean F. O. McMillan, Oregon State College; and J. S. Spease, General Electric Co., Portland. Bottom: Dr. Hugh Skilling, Stanford University, Lloyd Hunt, Southern California Edison Co., and H. H. Henline, national A.I.E.E. secretary

CONSTRUCTION OF SEATTLE INTERTIE IS STARTED

Under way at Seattle is construction of the recently announced interconnection of Puget Sound Power & Light Co. and Seattle City Light, estimated to yield the two utilities a gross saving of $1,269,000, assuming average water years, $1,162,000, assuming minimum water years, both throughout the 40-month life of the contract.

Being built by the company is a 4-mi., 55-kv., aluminum-conductor line connecting its Canal St. substation with the City's North receiving substation. A 30,000-kva. transformer bank at the city end will connect to the city's 26-kv. bus.

The bank is General Electric, water-cooled, with load ratio control of plus or minus 10 per cent. Pacific Electric Mfg. Co. is furnishing oil circuit breakers. The equipment is to be leased by the City, which will eventually purchase it out of energy sales.

In general, the City will draw power during Oct., Nov., Dec., and Jan., of minimum water years, the company during other months.

Power rates are: hydro, 2 mills; steam from the company (Shuffleton plant), 4 mills; steam from the City (Lake Union plant), 7 mills. A preliminary study indicated, roughly, that City would use from 3 to 31 million kw.-hr. per year of company steam, that the company would use from 81 to 164 million kw.-hr. per year of City hydro.

Completion of the tie, estimated to cost about $214,000, is scheduled before Dec. 31. Contract expires March 1, 1941.

INJUNCTION AGAINST USE OF PWA FUNDS GRANTED

Injunction against the use of PWA funds for construction in the Imperial Valley of power lines parallelling and duplicating lines of the Nevada-California Electric Corp. was issued last month by the District of Columbia Court. The decision permits use of the funds—$2,760,000, the total of grant and loan—for construction of a hydro plant on the All-American Canal and enlargement of a diesel plant owned by the Imperial Irrigation District in Brawley.

In June voters of the District approved a PWA contract for construction of the hydro plant and competing distribution lines.

METROPOLITAN WATER DISTRICT directors in Los Angeles, last month asked that the time for beginning payments on Boulder Dam power be extended to about June, 1940. Power will be ready for delivery next June.

Big Chief Guy W. Faller of the Kee-Lo-Watt Tribe, better known as vice-president and general manager of the Public Service Co. of Colorado and president of the R.M.E.L.

MAHOOD STRIKES AT INCREASING TAXES

A warning against the increasing utility tax burden was sounded by President Alexander M. Mahood of the National Assn. of Railroad and Utilities Commissioners last month, when 300 members of that organization convened in Salt Lake City. He said utilities in some states have asked rate increases just because of taxes.

Both the save- and soak-the-utilities schools of thought were evident, but the bulk of time was devoted to hard work on the everyday problems of regulation.

Last year's expressed fear that the Federal Power Commission might absorb state power was again discredited by Robert Healey. The Hon. Ferd J. Schaaf, of Washington, reporting on rural electrification, said the most successful projects were those financed by utility companies with monthly guarantees. He said the general tendency was toward uniform rates with a minimum bill of $3 and $4.

Mr. Mahood was re-elected president, and J. J. Murphy South Dakota, and Homer Hock, Kansas, were chosen to represent the West.

SUBSTANTIAL AGREEMENT with Miller & Lux, Inc., for purchase by the Bureau of Reclamation of the company's water rights on the San Joaquin River, required for the California Central Valley project, was announced last month by Secretary of Interior Ickes. He approved an appraisal of $2,450,000 submitted by project consultants. Miller & Lux has offered to sell its rights for $2,500,000. Title to water in the lower San Joaquin is needed to allow effective storage and diversion at Friant Dam on the upper river, south to Fresno, Tulare, and Kern Counties, northwest to Madera County.

INDUSTRY COOPERATION URGED AT R.M.E.L. CONCLAVE

Cooperative sales opportunities in the lighting and appliance fields, promotion of wiring adequacy, and necessary steps to be taken for improving public and customer goodwill were among the subjects discussed by experts at the annual convention of the Rocky Mountain Electrical League at Estes Park, Colo., Sept. 12-15. More than 225 people from 20 states registered and took part in the deliberations.

President Guy W. Faller, vice-president and general manager of the Public Service Co. of Colorado, set the keynote in a plea for industry unity in which he outlined the benefits which have been derived from close cooperation between utilities, contractors, wholesalers, manufacturers and dealers in the Rocky Mountain region through the efforts of the league. In this he was seconded by Earl N. Peak, president of the N.E.C.A., who outlined the industry promotional movement sponsored by the contractors. Explaining that this is a joint program for building new business for the profit of all, he declared that its success would be the sum of the successes of local undertakings which follow through on the broad programs initiated nationally.

Plans for a $2,000,000 cooperative market development program in Colorado, Wyoming, New Mexico and South Dakota during the last three months of the year which will be backed up by a $125,000 promotional fund were described by Gaylord Buck, chairman of the league's sales and promotion section. This program will involve local activities based upon four national programs including the Better Light-Better Sight drive, G-E's "Electrical Standard of Living" plan, the national kitchen modernization program and the electrical housewares sales program. Superimposed on these will be the league's cooperative sales drive which will culminate in a special train trip to the Pasadena New Year's football game for 300 successful sales people.

Each of these activities was discussed in detail. E. W. Commery and H. Freeman Barnes, G-E Incandescent Lamp Dept., Nela Park, both pointed to the apparently inexhaustible source of sales and revenue provided by the home lighting field. Mr. Commery placed the market for I.E.S. lamps at 100,000,000 units, explained that the I.E.S. lamp was no cure-all for poor lighting and cautioned against too much sales enthusiasm in promising the homemaker more than the present lamps were able to deliver. Mr. Barnes in one of his characteristic well dramatized presentations, showed that 100 ft.-candles was the

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Shell showed this Coal Company how to Cut Mounting Costs of Mine-Car Maintenance!

"THEY'RE worse than a bunch of spoiled brats," said the Collinsville Coal Corp.'s maintenance engineer. "We have to nurse 'em like babies!"

A large number of plain-bearing mine cars are in use at the ¾-mile workings at Collinsville, Ill. Under the difficult conditions involved, this mine had always found the lubrication of their mine cars a slow, expensive and often unsatisfactory procedure. Shell was called in to help them solve this problem once and for all!

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The Shell recommendations were applied! And "pampering" the mine cars came to an end at Collinsville! A check after several months' trial showed lubrication time had been *cut in half* . . . cost sheets disclosed *a 25% saving* in lubricant alone!

The list of tough lubrication problems solved by Shell is growing every day. For this case is but one of thousands. The reason: Shell's "Invisible Element," the ingenuity to discover the cause of the trouble—the resources to remedy it *correctly!* This *plus* in lubrication is always available to you. Simply get in touch with your nearest Shell office.

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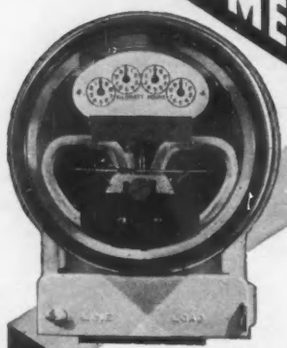

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next minimum the industry should set for its lighting goal and outlined a new sales technique based upon "light-conditioning" and "seeing spots" in the home.

Details of the "Electrical Standard of Living Plan" were presented by J. M. Walker, G-E Home Bureau, New York. This already has been endorsed by the Rocky Mountain League which plans to localize the program with additional prizes. How the national electrical housewares sales program will promote small appliance sales was explained by C. E. Greenwood, commercial director

J. H. Jacobucci, Wyoming manager of the Utah Power & Light Co., and newly elected R.M.E.L. president

of E.E.I. Before a product selling job can be accomplished, the basic idea of service and use must be sold, Mr. Greenwood declared in showing how small appliances are only used at the will of the consumer and hence require special sales effort.

Potential air conditioning markets were outlined by J. K. Knighton, Kelvinator Corp., Detroit. Explaining how the industry was solving its distribution problem, he cited two basic markets—the "profit market" where air conditioning is bought to improve the prospect's business, and the "comfort market" where it is purchased to provide comfort for the individual. Both can be sold by letting the prospect set up his own comparisons of value. Commercial and industrial lighting developments and opportunities were illustrated by G. Sheldon Spangler, Curtis Lighting Co., Inc., Chicago.

Abandonment of ill-advised sales policies by the utilities which has brought dealers actively into the merchandising picture was commended by Henry Voss, advertising manager, Denver Department Store.

Declaring that no wiring job had ever been oversold, L. B. Johnson, General Electric Co., Salt Lake, reviewed the adequate wiring problem and stated that neither the industry nor the public is aware of the losses due to inadequate wiring facilities. Either undertake an expensive campaign to make electrical engineers out of all customers or simplify rates and measuring equipment was the admonition of H. P. Sparkes, Westinghouse meter department, Newark, N. J. He described and illustrated many "horrible examples" of rates and metering equipment which he declared were certain to arouse public suspicion. L. M. Robertson, chairman of the league's engineering section, cited studies made by his colleagues which have saved dollars for the operating companies.

The human relations problem of the industry was attacked by two speakers. Earl W. Hodges, Cities Service Co., New York, declared that the industry must learn how to get along better with people—public, customers and employees. Dr. Adam S. Bennion, assistant to the president, Utah Power & Light Co., made a plea for more careful selection and better training of employees.

The league's annual award for meritorious service to the electrical industry was presented to John E. Loiseau, secretary, Public Service Co. of Colorado, for his work in improving dealer relations. New officers elected were J. H. Jacobucci, Utah Power & Light Co., Green River, Wyo., president; H. E. Sampson, Southwest Public Service Co., Roswell, N. M.; Thomas W. Hughes, Sheridan County Electric Co., Sheridan, Wyo.; E. E. Brazier, General Electric Supply Co., Denver, and John E. Loiseau, vice-presidents; and W. C. Sterne, Arvada Electric Co., Denver, treasurer.

J. A. Bullock, Western Colorado Power Co. (left), smiles with John E. Loiseau over latter's receiving the R.M.E.L. award

Theme of the entertainment centered around the annual "pow-wow" of the "Kee-Lo-Watt" Tribe. One feature was a banquet for sixty-odd members with 25 or more years of service in the industry.

●

SURVEYS OF CABINET GORGE power site on Clark's Fork River near the Idaho-Montana line are being pushed forward while good weather holds.

New Report Form Prescribed by F. P. C.

A new form of annual report has been prescribed by the Federal Power Commission, for Class A and B utilities achieving the long-sought goal of regulatory agencies—nation-wide uniformity in public utility accounting and reporting. The form is designated F.P.C. No. 1, consists of 147 schedules and 137 pages, is sectionalized, so as to be flexible, and, when printed, will be in loose-leaf form.

Five present sections of the form are (1) identity; (2) balance sheet and supporting schedules; (3) income and surplus account and supporting schedules; (4) common plant, operating and statistical data, and (5) electric plant, operating and statistical data—5a, plant; 5b, operating revenues; 5c, operating expenses, and 5d, miscellaneous statistics. Plans call for addition of two more sections: a rate section and a section applicable to projects licensed by the Commission under the provisions of the Federal Power Act.

It complements the uniform system of accounts adopted by the Commission on June 16, 1936.

●

A. S. HANSEN Co. of Seattle submitting the low bid of $106,948.40, has been awarded the contract for constructing a switchboard building and equipment foundations at Seattle City Light's south receiving substation, Fourth Ave. South and Spokane St.

●

Power Association Names W. A. Huckins

Getting off to an early start with a meeting of the executive committee in Portland, the Business Development Section of the Northwest Electric Light & Power Assn. named W. A. Huckins, Utah Power & Light Co., Salt Lake City, vice-chairman. Committee heads appointed by Section Chairman Ralph E. Gale of the Idaho Power Co. are: A. H. Wegner, Washington Water Power Co., Spokane, industrial and commercial sales bureau; Henry Kruse, Puget Sound Power & Light Co., Seattle, residential sales bureau; W. Newmeyer, Portland General Electric Co., Salem, rural sales bureau, and M. L. Cummings, Utah Power & Light Co., Salt Lake City, advertising.

●

INITIAL CONSTRUCTION in the Kennett division of the Central Valley Project in California was brought closer last month when three contracts were awarded for construction of the government camp to be located 14 mi. north of Redding.

ABANDONING plans to construct a diesel generating plant, the Inland Empire Rural Electrification, Inc., which will serve 1,530 rural customers in Washington and Idaho, last month signed a five-year contract for purchase of its energy from the Washington Water Power Co. Probable rates, all based per kw. of demand, are $3 initial charge including 200 kw.-hr., 1c per kw.-hr. for the next 100 kw.-hr., 6 mills for excess.

●

New Substation Built at Los Banos

Because of the increased demand for electricity in Los Banos, Calif., San Joaquin Light & Power Co. has replaced its old Los Banos substation at H and Tenth Sts. by a new $61,000 substation about three-quarters of a mile north of the city. The new structure, due for completion last month, is equipped with heavy duty oil circuit breakers on both the 70,000-volt and 11,000-volt transmission lines. The number of circuits handled will be increased from four to six.

●

PERMANENT INTERCONNECTIONS will replace the present temporary ones between systems of the West Kootenay Power Co. and the West Canadian Hydro, according to Lorne Campbell, manager of the former.

●

FEDERAL POWER COMMISSION has approved merger of the facilities of the Chelan Electric Co. of Wenatchee, Wash., and the Washington Water Power Co., operating out of Spokane.

●

ROY M. BUTCHER, San Jose, Calif., electrical contractor, who is wiring the new theater at Stanford University, was awarded the electrical work on reconstruction of Stanford Assembly Hall, which is to house the graduate school of business.

●

New All-Electric Home Opened at Preston, Idaho

Success with its All-Electric Home at Provo has been so decided that a new All-Electric Home at Preston, Ida., has been opened to the public by Utah Power & Light Co. It is the home of R. R. Rowell, company division manager, who has placed his home on display prior to occupancy by his family. Home service girls are hostesses to the visiting public. They explain the use of electrical devices and answer questions. A booklet written impartially in the interest of dealers in all lines of merchandise is given the hundreds of guests visiting the home.

Programs Announced by Maintenance Men

Programs outlined by the executive committees of the Electrical Development League and Electrical Maintenance Engineers, meeting jointly Aug. 24, are as follows:

For October — Because of the increased demand for domestic appliances as well as the beginning of industrial use of electrical heat, the subject will be electric heating and its various applications.

For November—Because of the interest expressed by members of the association, electronic tubes and their applications.

For December—Ladies' night with possibly a dinner-dance.

●

NEGOTIATIONS ARE now under way to determine whether electric light and power service shall be established in the town of Westbank, B. C. If the project is undertaken, the West Kootenay Power & Light Co. will lay cables across Okanagan Lake from Kelowna.

●

TEMPORARY RECONSTRUCTION of the Puget Sound Power & Light Co.'s Electron plant, damaged by a slide last November, has been completed at a cost of $100,000. Work involved clearing away wreckage and constructing a frame and galvanized structure to house two of the four turbines.

●

HEARING BEFORE the California State Supreme Court in San Francisco has been granted William W. Wahl and J. G. Wannop, seeking to have an election called to decide whether the Bidwell Municipal Utility District shall be dissolved. The action follows an adverse opinion handed down by the Third District Court of Appeals in Sacramento which ruled that the district is operating and that the directors cannot be forced to call the election.

●

F. B. CONNELLY Co., Seattle, took advantage of the Northwest Furniture show in Seattle, to stage a big display of electrical appliances. Department store arrangement was used with separate group showings of the various products distributed by the organization. W. R. McCurdy, general sales manager, was in charge of the exhibit.

●

ELECTRICAL ESTIMATORS CLUB of Los Angeles, resumed its meetings Sept. 16 at the Galley Coffee Shop, Los Angeles, when William Conyns, head of the electrical department of Frank Wiggins Trade School, gave a demonstration of diathermy short wave equipment. Geret Kritzer, Bureau of Power & Light, is president of the Estimators' Club.

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Klein "Lightweight" Climbers are built to the minimum weight possible consistent with maximum safety. Every pair is tested exactly the same as are the old time tried Standard Climbers. The lineman can throw his weight on these climbers with confidence —they are Klein's!

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The four pamphlets listed below will be sent without charge to anyone interested. Check the ones you want:

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- ☐ Klein Kord Fabric Safety Straps.
- ☐ Pocket Tool Guide.

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San Francisco to Face U. S. in Test of Raker Act

Claiming violation of the Raker Act, which grants San Francisco the right to develop water and power in Yosemite National Park and Stanislaus National Forest, the Federal government will bring to trial October 19 in Northern California U. S. District Court its suit to enjoin the city from disposing of Hetch Hetchy power through an agency agreement with the Pacific Gas & Electric Co. which has been in effect since 1925.

The government contends that the city must cancel its agency contract or risk forfeiture of its rights under the Act. The rights in question are those to occupy government lands, to have easements for power lines and canals and to take material for building purposes.

San Francisco is making a vigorous defense. In its answer it points out that its power plant is on privately owned property outside the Federal area; that most of the land in its reservoirs, while within the Park, is owned by the city in fee, and that the total value of all the land the city uses does not exceed $26,990.

The threat of forfeiture the city answers by alleging that there is no provision for forfeiture in the Raker Act and that if there were the government is estopped from asserting it by reason of the fact that it has recognized the existing contract for more than twelve years.

To August 31, 1937 the City has collected for its power $25,379,498.56, the net from which has been equivalent to 28 cents in the annual tax rate. In other words, cancellation of the contract would throw a burden of 28 cents each year upon every $100 worth of taxable property within the city.

The city also claims that it has been most generous in its dealings with the government; that it has expended $1,761,000 for roads and trails, greatly adding to the value of the Hetch Hetchy Valley as a National Park; that it is now paying an annual rental of $30,000 for the rights received; and that to date it has expended $167,000,000 in developing water and power, thereby levying a heavy indebtedness upon its taxpayers.

Other city claims are: That the city's water rights in the Hetch Hetchy Valley were obtained from the State of California, not from the Federal government; that the Raker Act clearly permits the execution of an agency contract and that the present contract with the P. G. & E. is in accord with public policy established in regard to Boulder Dam, Yosemite Valley power plant, Turlock and Modesto irrigation districts and other Reclamation Bureau power projects; that the people of the City of San Francisco want the contract to continue as they have shown by voting six times against proposals to enter municipal distribution, the first in 1927 and the latest on March 9, 1937.

●

CONTRACT for constructing 297.5 mi. of transmission line in Spokane, Whitman, Adams and Frankling Counties, Wash., has been awarded by Inland Empire Rural Electrification, Inc., to the Puget Construction Co. of Seattle on its bid of $247,212. Work was to start within ten days following official approval of the award in Washington, D. C.

●

P. G. & E. to Build Plant at Associated Refinery

Under a contract approved last month by the California Railroad Commission, the Pacific Gas & Electric Co. will build a 35,000-kw. high-pressure steam generating plant at Tidewater Associated Oil Co.'s refinery at Avon, Calif. P.G. & E. will sell electric energy and steam to the refinery, buy petroleum sludge or other fuel.

Since an electrification of the refinery's equipment will raise its demand to only about 8,000 kw., and since the load factor approximates 80 per cent, P.G. & E. will add considerable steam capacity to its lines. Power factor at the refinery approximates 97 per cent.

Generation will be at 12,000 volts, stepped down to 2,300 volts for delivery to the refinery, stepped up to 110 kv. for transmission.

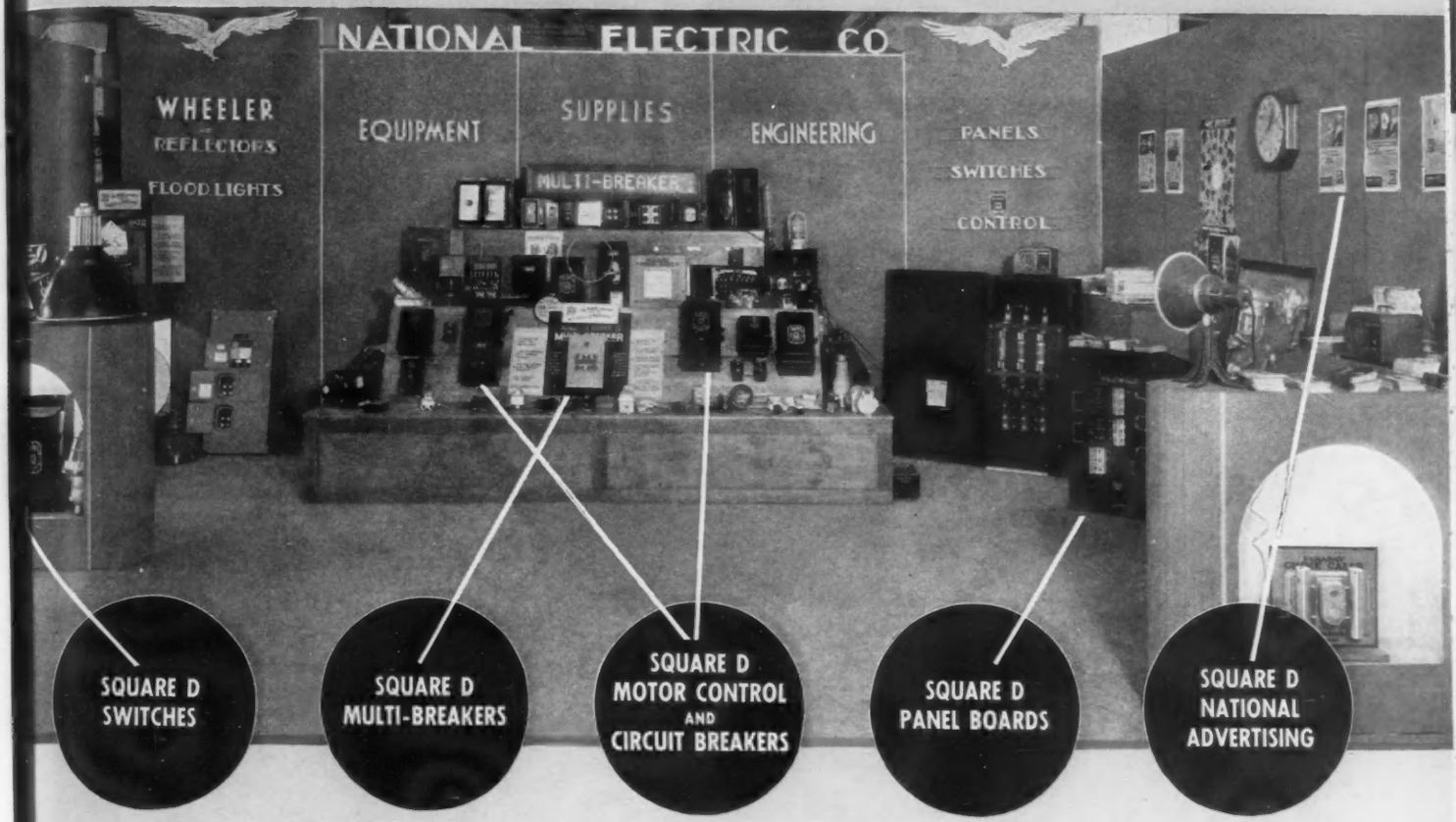
The installation, expected to cost $5,000,000, will consist primarily of a a single turbo-generator, and three boilers, furnishing steam at 1,500 lb., 925 deg., each delivering 200,000 lb. per hr. Steam bled from the turbine will be delivered to the refinery at 160 lb., 50 deg. superheat. Boilers will burn petroleum sludge, fuel oil, or natural gas available from a nearby line.

Demand charge for electric service will be $6,250 per month up to 5,000 kw., and $1.20 per kw. per month for excess. Quantity charge will be ½ mill plus 0.0021 barrels of fuel oil or equivalent per kw.-hr.

Demand charge for steam will be $2,000 per month for 275,000 lb. per hr. or less. Quantity charge will be 2c and 0.265 barrels of fuel oil per 1,000 lb. for the first 125,000,000 lb. per month, and 1½c and the same fuel rate for excess.

Design of the new station in under way. Construction is expected to begin early next year with completion scheduled for April, 1939.

It Pays to Make SQUARE D a Leader!



• **The Square D name is known everywhere . . . Square D electrical equipment is used everywhere . . . Square D products are available everywhere.**

This illustration of a display of the National Electric Company, Passaic, New Jersey, is evidence of the worth of the Square D line as a profitable leader for any electrical wholesaler or electrical contractor.

Note the prominence of Square D equipment and Square D merchandising material in this display. Square D Switches, Motor Control, Panelboards, Circuit Breakers; the Square D Multi-breakeR and Square D window displays, Pressure Switch wall hangers and Square D's National and Industrial Advertising.

This type of merchandising co-operation, and the Square D policy of working closely with its outlets, plus the diversity and adaptability of Square D products and the constant research activities of the engineering staff, all help to maintain Square D leadership for wholesalers and contractors.

CALL IN A SQUARE D MAN

SQUARE D COMPANY

LOS ANGELES - DETROIT - MILWAUKEE

SQUARE D COMPANY CANADA LTD. TORONTO, ONTARIO

Square D electrical devices are available through electrical wholesalers everywhere.

AUTOMATIC ELECTRIC

INTERCOM. SYSTEMS

Modern business needs fast, accurate telephonic intercommunication! So do modern homes! Take advantage of this rapidly growing demand for high quality, reasonably-priced interior telephone service by selling Automatic Electric Intercom. Systems.

Made by one of the largest and oldest manufacturers of public telephone exchange equipment in the world, Automatic Electric Intercom. Systems can be relied upon to provide highly satisfactory service with long, trouble-free life.

Supplied in capacities of 2, 6, 10 and 11 stations, with wall or desk type telephones. Write TODAY for catalog and discount sheet.

Automatic Electric Intercom. Systems are designed for private service. They cannot be connected with the public telephone system.

American Automatic Electric Sales Company

1033 West Van Buren Street - Chicago

Los Angeles Office: 555 S. Flower St.

San Francisco Office: 325 Ninth St.

ALVORD SMALLEY RICE CARPENTER

P. C. E. A. Conclave Held in San Francisco

That America needs an organized, vocal, and active philosophy of conservatism—not reaction—was the constructive and penetrating idea that Dr. David P. Barrows, past president of University of California and professor of political science, delivered to the 375 who jammed the noon luncheon meeting of the San Francisco conclave, Pacific Coast Electrical Assn., Sept. 23. Distinguishing conservatism from reaction, Dr. Barrows related the experience of England in its recovery from depression when it turned in its crisis to the conservative leadership of the nation. He urged a doctrine of vocal, understanding, convincing, honest, accurate, and learned conservatism to steady the nation and restrain it in crises from panicky turns to radical and experimental doctrine as a solution of its problems. Quoting Edmund Burke, he reminded his listeners that "Society is a compact between the living, the dead, and the yet unborn."

Except for the occasion of Dr. Barrows' stirring challenge to a self reliant philosophy, no other general or outside speakers addressed the northern California conclave. The first general session was brief, only allowing President Raymond Alvord the privilege of outlining the policy of the association for the year, and to direct those attending to the parallel sessions of the three sections — Operating Economics, Business Development, and Administrative Services.

The Friday luncheon was likewise turned into a working session, for then the chairmen of the three sections outlined in brief the contemplated work of each of their committees as developed in the parallel sessions thus far. Since a more complete summary of these projects will be given in the November ELECTRICAL WEST, a very brief review of the high points of these reports follows:

Training personnel for greater efficiency and flexibility in the operating departments was the broad subject with which the Operating Economics Section, meeting en masse, opened its discussions. D. D. Smalley, general superintendent, San Joaquin Light & Power Corp., section chairman, presided. Recommended was the appointment of an operating committee to meet jointly with the Administrative Section's personnel group to study the job problem. Production men discussed topping turbines, fire-wall and refractory problems in modern boilers, automatic hydro plants. Given special attention by the transmission and distribution group were underground cables for serving new residential tracts, and problems rising out of using static capacitors in conjunction with regulating equipment already on the lines. Metering men urged coordination with rate departments in attacking the demand-metering problem, sought to sound out opinion on meter-size standards. A new group, safety, gave special attention to counter-shock, and the advisability of grounding pole-equipment.

Business Development committee work, according to H. C. Rice, chairman of the section, reporting on behalf of H. W. Edmund, vice chairman, will be carried on by committees on lighting, agricultural power, commercial and industrial power, air conditioning, appliance merchandising, adequate wiring, and advertising and publicity. The lighting group will develop a school lighting program, tackle the difficult problem of domestic lighting, work with inspectors associations on in-built lighting, and the R. L. M. Institute of industrial lighting. The agricultural group plans to revise and bring up to date its sales-valuable handbook, study overhead irrigation, and dairy equipment. Air conditioning sales promotion, market potential, and the effect of that type of load on system operating conditions will occupy both this committee of the Business Development and a similar committee from the Operating Economics Section. The appliance merchandising committee will recommend more time between campaigns to permit better organization and follow up; will likewise study, analyze, and eventually budget for a sales training course to provide the industry with new salesmen and improve the present sales forces. In the adequate wiring committee architects asked for an impartial technical advisory service on wiring and educational meetings similar to those of the Portland

Paul Downing, standing, introducing Dr. David P. Barrows (seated, right) at the Thursday luncheon

Cement association. Publicity plans and work to get ordinance requirements of 1¼ conduit as service minimum are also to be recommended. The commercial and industrial power committee recommended more meetings to allow those engaged in this sales work an opportunity to exchange advice and experience, plus a revision of the old power sales handbook. Finally the advertising and publicity committee hopes to take the recommendations of each of the committees in the association as to advertising and publicity and boil them down into one recommended program for the association.

Work of the Administrative Services Section, temporarily headed by R. E. Fisher and A. B. Carpenter, last year's chairman and vice-chairman, dealt with public relations, credit systems and personnel problems, the last a new division in the section. All of the discussions were aimed at better treatment for the customer. Effectiveness of periodic public relations audits by men experienced in all phases of the company's policies was determined to be an effective means of measuring customer sentiment. Steps were initiated to secure accurate figures on the cost of servicing customer's appliances. Possible simplified forms related to customer accounts were studied. Credit rating customers by coding and simpler policies for establishing credit were urged. Personnel problems were studied from the angle of central vs. localized hiring, job rating and analysis, and promotion practices. Harry C. Ross, manager of P. G. & E.'s claims department, was introduced as the new section chairman.

●

TOTAL GROSS REVENUE of the British Columbia Power Corp., Ltd., owner and controller of the B.C. Electric Railway Co., the B.C. Power & Gas Co., the Victoria Electric Co., the Victoria Gas Co. and other power companies on Vancouver Island and the mainland, last year was $14,908,788. Deduction of operating expenses, taxes and depreciation left a net revenue of $4,503,086. Surplus profit was $66,288.

●

GEORGE A. CASTLE, proprietor of the electric department in Cohn Bros. Furniture Store, Spokane, has been named distributor for Duro Electric water systems and water softeners for the Spokane region.

●

W. E. KIRK, representing the W. W. Kirk Co. of Los Angeles, has moved his headquarters to 23 Main St., San Francisco. The firm represents Delta-Star Electric Co., Standard Transformer Co. and others.

●

AIRPLANE MAPPING is to be employed by the Pacific Mills Limited, Ocean Falls, B.C., to survey a possible power site on Nascall Lake, together with 200 sq. mi. of timber area. No immediate developments are planned.

●

AIR CONDITIONING'S WATER requirements have lead the Marketing Research Division of the U. S. Department of Commerce to launch a study of water-use in cities of less than 100,000. Published recently were studies of larger cities.

L. A. Electric Club Has New Committee Chairmen

Cliff Thorburn, new president of the electric club, Los Angeles, has appointed the following men chairmen of the club committees: A. H. Gudie, Biddle Trade Bureau, Attendance; K. L. Sinclair, Square D Company, Auditing and Finance; S. E. Gates, General Electric Company, Civic and Inter-Club Relations; W. E. Cranston, Jr., Thermador Electrical Mfg. Co., Membership; M. G. Sues, Leo J. Meyberg Co., Program; D. W. Pontius, Pacific Electric Railway Company, Public Policy; Joseph A. Long, Southern California Edison Co., Publicity; E. F. Gould, Anaconda Wire & Cable Co., Sports; H. C. Kaufman, Westinghouse Electric & Mfg. Co., Stunts, and H. H. Cox, Department of Water & Power, Visiting and Relief.

"GAS & ELECTRIC Facilities in Western Washington and Northwestern Oregon" as of January 1, 1937, showing all electric lines down to and including primary rural distribution circuits, is a map just published by Frank I. Towle Jr., 403 Corbett Bldg., Portland, Ore. The size is 30x47 in., scale: 1 in. to 8 mi., price $18.50.

●

WITNESSES before the Board of Engineers for Rivers and Harbors, urging immediate installation of generators at Fort Peck dam, have been unable to present concrete evidence that there will be a market for the power. The district engineer has recommended that installation be deferred until a market develops. However, this year's water shortage in Montana may lead the board to recommend an appropriation for installation of at least one of the 35,000 kw. units.

Six G-E single-phase station-type induction regulators, 48 kva, 2400 volts. Installed at the Dallas Substation of the El Paso Electric Company

Your Customer Also Benefits

from Correct Voltage at the Entrance Switch

CUSTOMERS of the El Paso Electric Company are getting the maximum return on each dollar invested in light, heat, and power—because full-bodied volts are coming over the feeders regulated by these G-E equipments. This is also important to the Company because it knows that good service of this kind keeps existing appliances on the line and encourages the use of new ones.

Regulation with G-E equipment will benefit you just as it benefits the El Paso Electric Co. First, revenue which might otherwise be lost is recorded on the meters; second, load growth is encouraged.

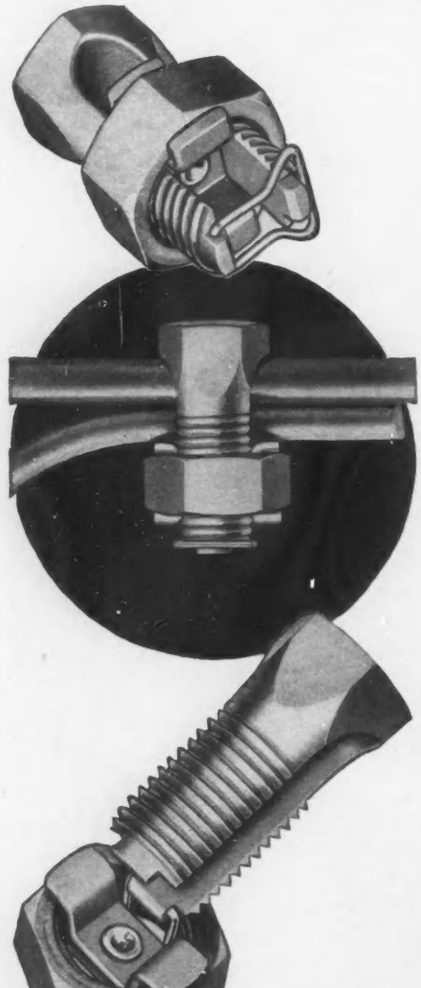
Regulation is a profitable investment anyway you figure it. Furthermore, the complete line of G-E regulators makes it possible to regulate the system economically at any point and for any load density. Ask for our portfolio "The 8 Point Plan for Profitable Voltage Regulation." (GES-1142A). General Electric, Schenectady, N. Y.

350-135D

GENERAL ELECTRIC

Reliable

HINGED-NUT CONNECTORS



Made of High Strength Bronze, 90% copper, with uniformly machined threads and fine workmanship—outstanding in convenience, efficiency, and strength.

Reliable ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES
3145 CARROLL AVENUE • CHICAGO ILLINOIS

Bonneville Appointment Remains in Offing

Speculation as to the cause of the delay in the appointment of an administrator for the Bonneville project continued rife last month. An answer was seen in the fact that the job will be no government sinecure.

Standing in the new administrator's way will be the task of finding a market, keen competition from both private and municipal generating plants and eventually from the Grand Coulee development and a bitter sectional battle over the method of determining rates. Aded to this will be the problem of disposing of power.

As a year or more must elapse before any public authority will be in a position to take power, interim arrangements with private utilities must contain a withdrawal clause. This probably will mean that an unremunerative rate will have to be offered to attract any private user, and to increase that rate later in contracts made with public authorities will require much explaining.

Only immediate way of getting energy from Bonneville would be connection to a nearby Northwestern Electric Co. line. This might permit the use of 20,000 kw., only a fraction of Bonneville's present installed capacity.

●

DARKNESS PREVAILED in Globe, Ariz., on Aug. 30 as the result of an electrical and wind storm which blew over one of the stacks at the Arizona Edison Co.'s power plant and broke two primary circuits. Although partial service was furnished by the Old Dominion Co., the city was without lights for 45 minutes.

C. A. CARLSON ELECTRIC CO. of Seattle, bidding $189,817 on the construction of 233 mi. of line in Latah County, Ida., and Whitman County, Wash., has been awarded the contract for building the first unit of the Clearwater Valley Light & Power Assn.'s $2,075,000 rural electrification project. The contract calls for completion within 120 days.

●

West to Feel Effect of Miller-Tydings Act

Resale price maintenance contracts on trade-marked or branded merchandise is now permitted in interstate as well as intrastate commerce under terms of the recently passed Miller-Tydings price maintenance bill. This applies to the eleven Western states, all of which had previously passed so-called fair trade acts; and 30 others.

The new legislation, an amendment to the Sherman Anti-Trust Law and to the Federal Trade Commission Act, permits national and local manufacturers to contract with distributors, wholesalers or retailers for the maintenance of their established resale prices. This applies not only to retail prices but also to any or all steps or channels through which merchandise flows from the manufacturer to the consumer. In other words it could apply to price maintenance on trade-marked construction materials such as conduit, wire, switchboards, panelboards, reflectors, etc.

The law is further broadened so that execution of resale contracts is not limited to manufacturers and those purchasing from them. Any distributor, wholesaler or other person selling merchandise to another person who is purchasing it for resale may initiate a contract.

Home Service Women Meet in Chicago

When Hotpoint's sixth annual Home Service conference convened in Chicago last month the Western states accounted for the largest proportion of the 250 home service women who attended. Here they are shown at one of their sessions. Mrs. Mary Lowell Schwin, home economics director for Hotpoint, under whose supervision the conference was held, is the smiling figure in the center foreground

SIX SYSTEMS REDUCE RATES

New residential and commercial rates effective Aug. 1, on the California-Oregon Power Co. system will effect savings of $103,000 annually for 21,810 customers. The former 8c and 7c blocks have been cut to 6c for both services.

In the commercial schedule former steps of 25 kw-hr. at 8c, 125 at 7c, and 350 at 5c have been replaced by two steps of 250 kw-hr. at 6c, and 250 at 5c. Other steps are unchanged, lowest rate being 1½c for all over 2,500 kw-hr. Under the new domestic schedule former range combination service is available to all domestic customers with or without ranges. Former steps of 50 kw-hr. at 5½c, and 50 at 3c have been changed to 40 at 6c, and 60 at 3c. The next step of 2c has been shortened from 150 to 125 kw-hr. while the 1¼c minimum for balance remains unchanged.

Effect is a slight change for very small users but savings for most that increase with use over 48 kw-hr. per month.

SALT RIVER VALLEY Water Users Assn. has announced reduction of domestic and farm rates, effective this month. Monthly minimum for 60 kw.-hr. is reduced from $3.60 to $3.00, on the combination lighting and cooking rate. The next 250 kw.-hr. per month cost 2⅛c per kw.-hr., excess 2c. A new house heating and water heating rate of 1c is offered.

PUGET SOUND Power & Light Co. reduced its electric rates to schools, churches and halls approximately 18½ per cent June 1. The reduction will save these consumers $17,000 a year.

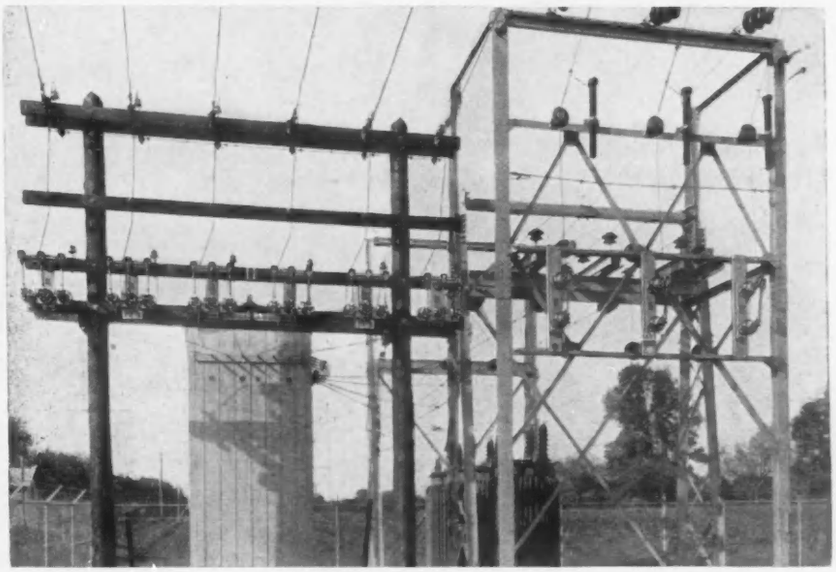
CENTRALIA, WASH., has reduced its municipal domestic combination rates, provided lower minimums for water heating and heating rates, and eliminated any commercial flat rate under $2.50.

PASADENA residents will save $100,000 per year through rate reductions effective July 1. The 50c minimum to residential customers remains.

ALAMEDA, Lodi, Redding, Roseville, Santa Clara, Gridley and Biggs, Calif., will save a total of $30,000 annually as the result of the Pacific Gas & Electric Co.'s reduction in wholesale rates to municipally owned systems and a few private utilities. Average cut is 4.3 per cent. New rates went into effect Sept. 1.

S&C RECLOSERS REDUCE OPERATING EXPENSES

On Feeder and Customer Substations, Too



Feeder substation with S & C protection—three S & C Semafor Cutouts on the 13,000-Volt primary and six S & C Semafor Recloser Cutouts on the 4000-Volt secondary.

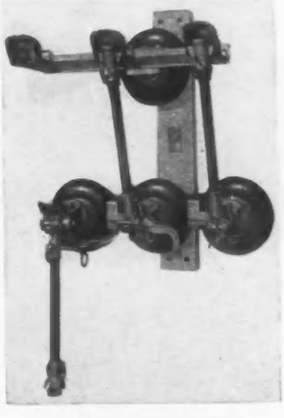
● Not only are S & C Reclosers being used extensively for Line Sectionalizing—but now a *New Field of Application* is served also—feeder substations and customer substations.

The lower initial cost—lower installation cost—lower operating cost—together with reliable protection, are S & C Recloser advantages that are not being overlooked by power company men today . . . They make it possible to provide protection where other automatic reclosing circuit-interrupting equipment might not be warranted because of higher cost . . . The simplicity of design — few parts—result in Reliability of Performance.

These Reclosers embody the S & C spring and cable principle in the fuse holder, and—for the best results should be used with S & C Fuse links.

Use S & C Reclosers and Fuse Links for dependable protection of distribution lines and feeder and customer substations.

REG U.S. PAT OFF



S & C Type RSO Semafor Recloser, an accurate, reliable circuit-breaking protective device. Service is automatically restored after a fuse blows—the blown fuse swinging down indicating its condition. Fully described in NEW Bulletin No. 215-B.

WESTERN REPRESENTATIVES

San Francisco: Geo. E. Honn, 420 Market Street
Los Angeles: Farnham & Cunningham, Edison Bldg.
Seattle: T. S. Wood, 220 Ninth Street, North
Salt Lake City: Riter Engineering Co., Kearns Bldg.

SCHWEITZER & CONRAD, Inc.
4435 RAVENSWOOD AVENUE . . . CHICAGO, ILLINOIS
Manufactured in Canada by Powerlite Devices, Ltd., Toronto, Can.

HIGH LOAD FACTOR ELECTRIC HEATING EQUIPMENT

- AUTOMATIC DOUBLE THROW SWITCHES for water heaters (30 amperes).
- QUICK BREAK ACCURATE THERMOSTATS (Non-radio interfering).
- SPEEDY SCREENED ELECTRIC RANGE REPLACEMENT UNITS.
- RADIATING-CIRCULATING AUTOMATIC HEATERS (20% radiant 80% convection).
- DAIRY STERILIZERS (5 to 15 kilowatts).
- FAST RECOVERY AUTOMATIC WATER HEATERS (Storage tank type, Circulation type, Immersion type).
- NON-CORROSIVE TANKS GUARANTEED 20 YEARS (Copper, Everdur and Monel).
- TIMERS (30 amperes) RUGGED, DEPENDABLE.

Wesix Electric Heater Factory

San Francisco Portland Seattle
Los Angeles

New nut housing. Locks Anchor firmly on rod. Rod cannot slip thru Anchor when being installed.

EVERSTICK ANCHORS...

Engineers appreciate Everstick features which assure safety, long life and ease of installation in any soil condition. A complete line of 3 types of expanding Anchors and rigid types of Cone Anchors. All sizes and holding capacities. Write for Everstick literature including new folder on Rural Electrification Lines.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

Apprentice Training Program About Ready

In spite of conflicting opinions which tend to impede the development of details, the recently inaugurated indenture apprentice training program will be put into effect in the near future. Such is the report of the educational committee of the Electrical Maintenance Engineers Assn. of southern California.

Controversy concerning the program revolves about the question of whether the schooling planned for the young apprentice is not more than that required by the average maintenance engineer. In the face of arguments favoring this stand, the association has, since announcement in ELECTRICAL WEST in June, received fifteen inquiries regarding such details of the program as age limit, qualifications for entrance, etc.

Final settlement of the controversy, however, lies in the employers' hands. Do employers want all-around maintenance men or do they want specialists for each section of their plants?

Majority opinion favors the first stand. Employers prefer all-around men because payrolls are thereby reduced in size. Prospective employees want a broad education because, in slack periods of production, they can more safely count on steady employment.

Aside from this difficulty, however, the program has been shaping up rapidly. With the selection late last month of the Frank Wiggins trade school as the agency to carry on the course, actual beginning of the program seems closer at hand than previously indicated.

●

E. W. MORRIS, Westinghouse Electric & Mfg. Co. engineer, was speaker at the Sept. 21st meeting of the E.M.E.A., describing the theory of electronic tubes, the various types and their advantages.

●

THE QUINAULT LIGHT CO., Hoquiam, Wash., has been granted permit for water rights on Ziegler Creek, near Lake Quinault. A 2,500-ft. pipe line will carry water from source to power unit. REA funds have been allotted to finance project. Fred H. Nichols is construction manager.

●

LICENSE TO ENLARGE its hydro development on the Crooked River in Jefferson County, Oregon, has been requested of the Federal Power Commission by the Inland Power & Light Co.* It is proposed to construct a new diversion dam and headgates and to enlarge the power house, increasing installed capacity from 1,400 to 4,400 hp., available 90 per cent of the time.

* Application to transfer Inland properties to Pacific Power & Light Co. is pending before the commission.

RURAL POLE LINE CONSTRUCTION *DEMANDS*

such as

★ **Cross Arm Braces**

and

★ **Pole Steps**

and

★ **Guy Clamps**

Manufactured and Stocked For Your Convenience On The Pacific Coast By

KORTICK MANUFACTURING CO.

Executive Offices, Plant & Main Warehouse:
345 First St., San Francisco, Calif.

Complete Warehouse Stocks at:
PORTLAND • LOS ANGELES • SEATTLE

PRODUCTION OF ELECTRICITY for public use in the U. S. reached the unprecedented total of 117,994,000,000 kw-hr. during the twelve-month period ending July 31, the Federal Power Commission reported last month. Although this total does not include electric energy produced by street and interurban railways, electrified steam railroads and miscellaneous Federal, state and other plants, it represents an increase of more than eleven billion kw-hr. over the corresponding period of 1936.

●

IN THE FIRST ELECTION to be held since Colorado legislators passed a bill providing that only properly assessed taxpayers are eligible to vote on municipal ownership matters, Englewood taxpayers last month rejected a proposal to issue $550,000 worth of revenue bonds to acquire the distribution facilities of the Colorado Central Power Co. and to build a city generating system. Vote on the proposal was 786 to 485.

●

THE MOUNTAIN STATES POWER CO. is reconstructing 4½ miles of line near Columbia Falls, Mont., and rehabilitating distribution lines within the town at a cost of $10,000.

●

WITH A SALE of $1,564,748 worth of electrical energy, Pasadena, Calif., Municipal Light & Power Dept. this year showed an increase in earnings of $130,647 over last year. After making all charges for operation, depreciation, etc., the system had a surplus of $306,457. This was $102,831 more than that for 1935-36.

●

SEATTLE CITY LIGHT excursions to the Skagit hydro-electric project broke all records for attendance this summer, W. J. McKeen, acting superintendent, reported early last month. More than 20,000 persons were booked this year as compared with 16,764 last year.

●

WHEN INSTALLATION is completed, Ladysmith, B. C., will be the first town on Vancouver Island to boast a street lighting system with mercury vapor lamps.

●

THE POWER LINE being built by Seattle City Light south of Renton airport has invoked a storm of protests from airplane pilots and other aviation enthusiasts, who declare it will seriously jeopardize the only commercial seaplane base near Seattle. Glen Smith of the City Light said the protests came too late, as contracts have been let and work is in progress. He said it would cost more than $100,000 to carry the line around Renton and that other obstructions are closer to the airport than is the line.

BTC
Hardware
Drop Forged
3007 Ball Hook
6204 Clamps
Caps
Ball Studs
If it's Hi-Line Hardware - it's in this Book
. . . Sold through Your Insulator Mfr. Only
BTC
THE BREWER-TITCHENER CORPORA...
The Brewer-Titchener Corp.
Cortland, New York
Photographed in our studio in duplicate of an actual hook-up. Six insulator units in actual string.

Dr. Brown Named S. F. I. E. S. President

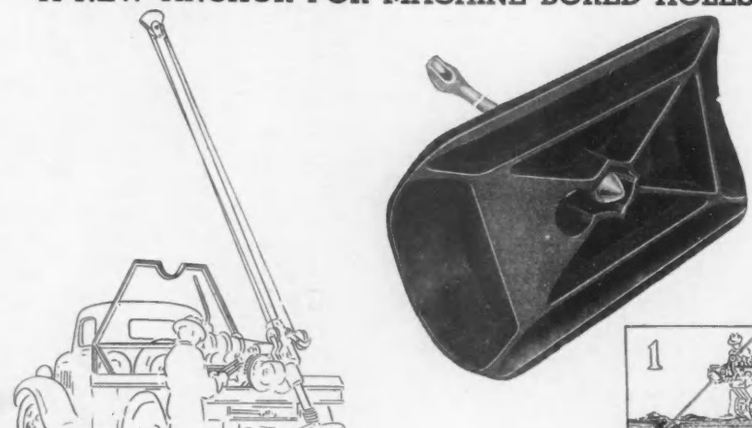
Before turning over the chairmanship of the San Francisco Bay Cities section of the Illuminating Engineering Society to Dr. L. H. Brown of Stanford University, Gilbert Trosper, Pacific Gas & Electric Co., San Francisco, outlined the program for bringing the I.E.S. convention to San Francisco in 1939, which he was taking to the convention this year. Frank A. Hansen, manager of the Western Institute of Light & Vision, Los Angeles, was the exchange guest speaker from the Southern California Section, for the occasion, a night meeting Sept. 16, 1937.

A membership increase to 63, bringing about a change in status from chapter to section, was reported by Leonard Hobbs, who also presented Mr. Trosper a farewell gift from the membership. Robert Dummell reporting for the program committee, John Erickson, secretary-treasurer on finances, Bob Dearborn, on a new residential lighting forum, and Nate Graves on stunts planned to publicize San Francisco for the convention, were heard before the meeting proceeded to election of officers. New officers are Dr. Leland H. Brown, president; R. G. Dummell, The Holophane Co., vice president, and John Erickson, Curtis Lighting, Inc., secretary-treasurer.

Interesting feature of the proposed residential forum will be an effort to bring together fixture maufacturers and their staffs in a series of meetings. Department store lighting sales people, architects, and eyesight specialists will be brought into the forum later.

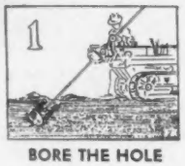
Frank Hansen described in considerable detail the purposes and the accomplishments of the Western Institute of Light and Vision in southern California. Its purpose, he said, has been to create a public interest so great that home owners and housekeepers shall desire and ask for good lighting. It was decided to go to the individual with the "science of seeing" story so that the individual would know what he was buying. The pamphlet "Seeing" has reached a circulation of 860,000 with orders for copies from Australia and Canada, and every state in the Union. Speakers committees have presented 1,363 talks to over 23,000 people. Demonstrations at county fairs, traffic safety talks over the radio and to a special traffic school, publicity stories in magazines, a lighting school for the electrical maintenance engineers, a lighting course in the Los Angeles School of Optometry, talks to school teachers' institutes, and exhibits in the county schools exhibits, were among the many activities in which the institute has played a prominent part.

A NEW ANCHOR FOR MACHINE BORED HOLES



THE DUAL NEVER CREEP

Here's a new development that serves a dual purpose. It is designed to use in machine bored holes and takes the place of the old bulky log, concrete block or improvised scrap iron slug wherever such anchorage is used.
It can be used either with the Never-Creep Rod or with a Threaded Rod.
Wherever boring machines are used this anchor will prove superior.



BORE THE HOLE

DRIVE THE ROD

HANG ON THE PLATE

A·B·CHANCE CO. Utilities Division

Distributed by G. E. Supply Corp.

CENTRALIA MISSOURI

FEELING THAT PAYMENT of the taxes would eliminate the necessity for trials which would cost both the state and the company several thousand dollars, Central Arizona Light & Power Co. on Aug. 31 paid back taxes totaling $468,877 plus accrued interest amounting to $98,795 and thereby wiped its slate clean of tax delinquencies. The payment, representing the difference between the amount the company admitted it owed (and had paid) for the years 1933, '34, '35 and '36 and the amount claimed due by the taxing authorities, was made to the state, Maricopa County, the towns of Glendale, Tempe, Buckeye, Gilbert and Chandler and 33 school districts.

●

LOWEST BIDS on three schedules in the construction of a 52-mi. rural electrification line were submitted to the Orcas Light & Power Co., East Sound, Wash., by the NePage McKenny Co. and the O. A. Carlson Electric Co., both of Seattle. The former asked $68,925 for aluminum wire and $70,996 for bare copper wire; the latter asked $71,464 for copperweld.

●

LINING AN EXISTING TUNNEL with concrete and installing a 19-ft. penstock, at Ruskin, B. C., will get under way shortly as part of the British Columbia Electric Railway Co.'s $1,700,000 power expansion program.

●

COMPLETING ITS POWER LINE from Tungsten mine, Sierra Pacific Power Co. late in August turned electricity into the distribution lines of the Western States Utilities Co. system at Winnemucca, Nev. Started June 7, the new line stretches 64 mi. from the Tungsten mine to the Getchell mine at Kelly Creek. The Winnemucca tie-in is 26 mi. from Tungsten.

●

FALL CONVENTION of the Pacific Division of the National Electrical Wholesalers' Assn. will be held at the Santa Barbara Biltmore, Santa Barbara, Calif., Oct. 14-16. Burrell Manuel, Los Angeles manager of Wesco, the new chairman of the division, will preside.

●

I. E. S. "GAMBOLIEREE" was the title given Southern California chapter I.E.S. annual social stag event and inauguration of new officers. The affair was held at the Adway Hotel, Los Angeles, Sept. 14.

●

IDAHO FALLS' application to draw water from the south fork of Snake River was withdrawn following approval of its project at Upper Mesa Falls on the north fork.*

* Electrical West, June, 1937, page 172.

About People

Harry Beecher, Dean of Inspectors, Dies

Harry N. Beecher did not live to receive the honor bestowed upon him at the last convention by the Southwestern Section, International Association of Electrical Inspectors, of which he had been president in 1927 and 1928. He was made honorary member for life. Mr. Beecher, chief electrical inspector, city of Los Angeles, was planning to retire in July from a career in the electrical industry begun in 1890. But the

HARRY BEECHER

heart ailment which dodged him for the past two or three years, and prevented his attendance at recent conventions claimed him first. Known and loved by the electrical industry in Southern California, Harry Beecher will be missed for his genial personality, sense of humor, and thorough devotion to his industry.

Mr. Beecher entered the electrical industry in 1890, when he went to work for M. J. Keese, electrical engineer. In 1896 he was put in charge of electrical distribution for the Pasadena Lighting Co., and the following year joined the Long Beach Lighting Co. In 1900 he was appointed deputy electrical inspector in the department of electricity, Los Angeles, under R. H. Manahan, who was then chief electrical inspector. When, a year later, Mr. Manahan was promoted to city electrician, Mr. Beecher succeeded him as chief inspector, a position he has held since.

Oliver K. Jones, an inspector for 14 years in the electrical division, was appointed by the Board of Building and Safety to fill the vacancy as chief electrical inspector for Los Angeles.

●

DR. JOHN R. HAYNES, for sixteen years a member of the Los Angeles Board of Water and Power Commissioners, has been re-elected president of the board for the 1937-38 fiscal year. Watt L. Moreland was re-elected vice-president.

WORKING UP from his first position in 1922 as lineman, Ed Conroy last month became assistant to the general superintendent of the Puget Sound Power & Light Co. He is succeeded in his former position as superintendent of the Bremerton area by Lyman Chitty, company employee since 1916.

●

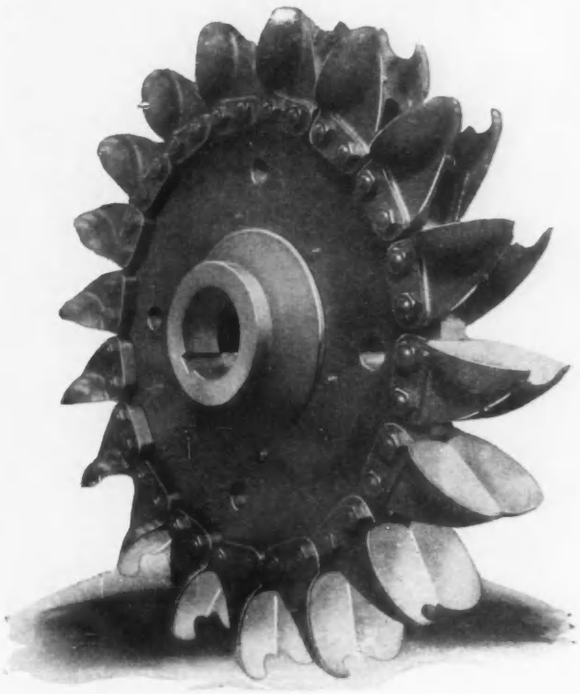
WILLIAM VOGEL, president, and C. D. Littleton, general manager, of Electrical Appliance Service Corp., Los Angeles, recently returned from a 7800-mi. trip on which they studied factory methods and policies in over 30 of the nation's largest firms.

Utah Chapter, I.A.E.I., Elects Educational Director

Following a speech by I. S. Noall, vocational director of the Salt Lake City Board of Education, in which he said that substantial sums of Federal money are available to groups interested in systematized study of technical problems, the Utah Chapter, I.A.E.I., meeting Sept. 7 in the new hall furnished them by the Utah Power & Light Co., elected L. John Christenson educational director for the coming year.

Associates appointed by Mr. Christenson to help him carry out the educational program are W. W. Cox, J. C. Jacobs and A. E. Fleming.

Realize Maximum Output from the Existing Water Supply



TAKEN on the average the cost of new hydraulic equipment may be from 3 to 5 per cent of total development costs, and yet the performance of these mechanical units determines, to a marked degree, the ultimate success of the project.

Regardless of contemplated developments, logic suggests a careful analysis of the older plants... to determine the possibilities for increased capacity from existing water supply. Many of the older plants have been modernized at comparatively small cost, resulting in increased output with greater reliability and safety. Ask Pelton engineers for specific proof.

THE PELTON WATER WHEEL COMPANY

HYDRAULIC ENGINEERS

120 Broadway NEW YORK **2929 Nineteenth St. SAN FRANCISCO** **Paschall Station PHILADELPHIA**

PELTON

PERFORMANCE AND RELIABILITY

● **CHOSEN for their stamina, dependability and outstanding performance, the thirteen Gardner Transformers shown above were recently installed for the U. S. Treasury Department at Mills Field, San Francisco Airport. Investigate these remarkable transformers. Call our nearest representative.**

Specification of Transformers illustrated: 2—5 Kva; 2—10 Kva; 3—15 Kva; 2—25 Kva.—of 2400/4160 y to 120/240 volts capacity. And 2—5 Kva; 2—10 Kva.—of 2400/4160 to 32 volts capacity.

GARDNER ELECTRIC MFG. CO.

4227 Hollis St. Emeryville, Calif.

REPRESENTATIVES:

Geo. E. Honn Co., 420 Market St., San Francisco, Calif.; Utilities Supply Co., 1736 E. 15th St., Los Angeles, Calif.; Industrial Electric Co., 1304 Stewart St., Seattle, Wash.; Modern Electric Co., 37 Richards St., Salt Lake City, Utah; Kranefeld Eng'g Co., 3416 14th Ave., Denver, Colo.

GEO. E. HONN CO.

420 Market St. San Francisco

★ *Quick Service*

★ *Reliable Products*

★ *Local Stocks*

MANUFACTURERS' REPRESENTATIVE FOR:

TREE TRIMMING EQUIPMENT
- BARTLETT MANUFACTURING CO.

FRICTION AND RUBBER TAPES
- CLIFTON MANUFACTURING CO.

CROMPTON TONG TEST AMMETER
- COLUMBIA ELECTRIC MFG. CO.

PYREX INSULATORS
- CORNING GLASS WORKS
- BREWER-TITCHENER HARDWARE

TRANSFORMERS
- GARDNER ELECTRIC MFG. CO. *Power and Distribution Transformers*
- LEE SKIPWITH & CO., INC. *Niagara Air-Insulator Current Transformers*

CABLE GRIPS
- KELLEMS PRODUCTS, INC.

CONNECTORS, GROUND ROD CLAMPS, UTILITY HOISTS
- JASPER BLACKBURN PRODUCTS CORP.

METERING INSTRUMENTS
- LANDIS & GYR, INC.

NEON MULTIPLE PLUG FUSE
- PACIFIC INDICATOR CO.

FUSES, CUTOUTS, PROTECTIVE DEVICES
- SCHWEITZER & CONRAD, INC.

UNDERGROUND TOOLS & EQUIPMENT
- T. J. COPE INCORPORATED

CAPACITORS
- CORNELL-DUBILIER CORP. *World's Largest Exclusive Mfrs. of Capacitors*

In other business of the meeting, D. W. Hatfield, of the electrical department of the Utah Copper Co., repeated his talk on "Applications of Electricity to the Copper Mining Industry" given at the recent joint annual session of the Northwestern and Southwestern sections.

●

ROY WILKINS

GEORGE E. HONN last month announced that Roy Wilkins is now associated with him in the George E. Honn Co., San Francisco. Mr. Wilkins, a fellow in the A.I.E.E., has in the past been connected with the Pacific Gas & Electric Co., vice-president in charge of engineering for the Pacific Electric Mfg. Co. and engineer for the K-P-F Electric Co.

●

Ill Health Forces Curtis' Retirement

Sam Curtis, chief electrical inspector under Ralph Wiley, chief of the Department of Electricity, San Francisco, retired Sept. 1 because of ill health. In his place, Harold Gerber has been made chief inspector. Mr. Curtis had been connected with the electrical division since 1914, assuming the position of chief inspector upon the retirement of Edward Henzel, in 1928.

Mr. Gerber has been with the department since 1925 and at one time entered private consulting engineering practice. During the past year he has been acting chief inspector. He is secretary-treasurer of the Northwestern section International Assn. of Electrical Inspectors.

●

Lloyd A. Gates Elected I. E. S. Head

Lloyd A. Gates, lighting engineer of the Department of Water and Power, Los Angeles, was elected chairman of the southern California section, Illuminating Engineering Society, at its recent annual meeting. Prior to his connection with the department Mr. Gates was a member of the staff of the South Pacific

Division, Incandescent Lamp Dept., General Electric Co., Los Angeles.

Foster K. Sampson, lighting sales supervisor, Southern California Edison Co., was named secretary of the Society. The board of managers consists of H. B. May, Jr., General Electric Co., chairman of the membership committee; Herbert Mayo, Smoot-Holman Co., chairman of the program committee; George M. Rankin, Southern California Edison Co., chairman of the nominating committee; A. E. Benedict, San Diego Consolidated Gas & Electric Co., and Frank A. Hansen, Western Institute of Light & Vision, chairman of the papers committee.

●

Ray U. Muffley Named Electric Club President

Ray U. Muffley, commercial manager of the Puget Sound Power & Light Co.'s central district in Seattle and former program chairman of the club, has been installed president of the Electric Club of Washington. He succeeds C. D. Hepler, president and manager of the Trumbull Electric Mfg. Co. of Seattle.

Other new officers are: M. P. Hotelling, state electrical inspector, first vice-president; Edward A. Will, branch manager, Allied Industries, second vice-president, and Charles Allison, Puget Sound Power & Light Co., treasurer. The new secretary will be appointed by President Muffley.

Trustees who were named are J. D. Sparks, Seattle representative, Ilg Electric Ventilating Co.; R. D. Hyneman, Graybar Electric Co., and A. J. Lutz, manager, General Electric Supply Corp., Seattle.

●

HAROLD J. MERILEES

HAROLD J. MERILEES, for the past six years a member of the British Columbia Electric Railway Co.'s publicity staff at Vancouver, took over organization and administration of sales promotion work, under W. C. Mainwaring, general sales manager, Sept. 1. P. M. T. Skrimshire of the publicity department at Victoria succeeded him.

BRASS TACKS

Smart dealers get down to brass tacks on any proposition. So does G-E Home Laundry Equipment. Right now, a practical pre-tested Fall Promotion is making *sales* for G-E Washer and Ironer Dealers.

Because this campaign gets down to brass tacks.

It's not too late—*you* can still get in.

GENERAL ELECTRIC

WASHERS . . . IRONERS

APPLIANCE AND MERCHANDISE DEPT., GENERAL ELECTRIC CO., BRIDGEPORT, CONN.

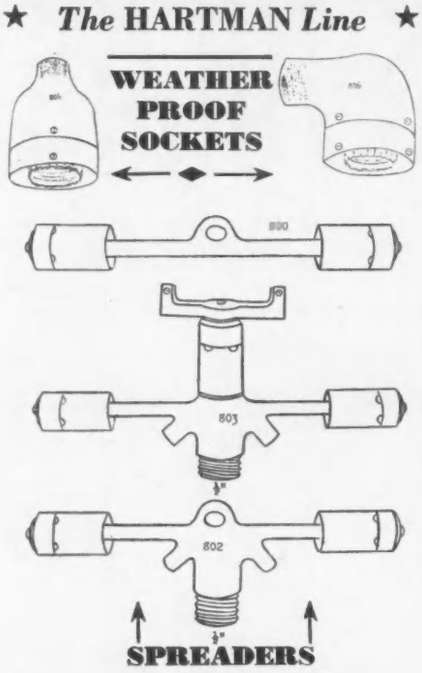
FACT FINDER

Inquiries to his Attorney and our Trust Officers showed him the importance of a properly drawn will in transferring his estate to his family. He then appointed us Executor of his estate.

TRUST DEPARTMENT

CROCKER FIRST NATIONAL BANK
of San Francisco

★ *The* **HARTMAN** *Line* ★



Hartman weather proof sockets and spreaders will make the most rigid job for outdoor wiring. No. 803 spreader made for 3-wire circuits.

For information see your jobber or write direct.

B. HARTMAN

168 Sunset St. Long Beach, Calif.

Kruse Promoted by Puget Sound P. & L.

Henry Kruse was last month advanced from his position as District Sales Manager for the Puget Sound Power & Light Co. at Everett, Wash., to that of merchandise sales and sales promotion director in the company's general office. He succeeded Ed Ross, who recently joined the merchandise advertising department of the Westinghouse Mfg. Co.

Succeeding him at Everett is Harry G. Arnold, previously connected with Sales Department of the Central Division in Seattle.

Ed H. Segale, assistant treasurer of the Everett District, has been made special assistant in the Treasurer's Department in the General Office. H. Byron Johnson has taken Segale's place.

●

JOHN R. JOHNSON

JOHN R. JOHNSON, Pacific Gas and Electric Co. district superintendent at Placerville, has been named manager of the Drum Division with headquarters at Auburn, to succeed Hugh M. Cooper. Mr. Johnson is a native of San Jose and a graduate electrical engineer from Stanford University with the class of 1911.

●

FREDERICK J. FISHER, pioneer electrician and electrical contractor in San Francisco died September 10, 1937. Mr. Fisher, long associated with theatrical and amusement business, first started as electrician for the old Chutes in San Francisco, then located on Haight Street some 40 years ago. With the Chutes he moved to Fulton Street near Golden Gate Park and continued there until he went into business operating a little shop in the alley back of the Crocker First National Bank building. During the time when the Industrial Association was conducting apprentice schools he acted as instructor for the electrical apprentice school. He had been inventor of a number of ingenious theatrical acts employing electrical apparatus.

●

LEROY CARLISLE WILLIAMS, well known in the electrical industry on the Pacific Coast, died in Los Angeles, Sept. 19. He was a past chairman of the Los Angeles section, A.I.E.E., and a member of the Electric and Engineers' clubs there.

●

FRANK S. PETERSON, new-business manager of the Denver district for the Public Service Co. of Colorado, died Aug. 18 following an operation. He was 38. Associated with the company since 1925, he is credited with promotional pioneering which led to the night illumination of Denver University Stadium, the Merchants' (baseball) Park and many softball diamonds throughout the region.

PROFESSIONAL SERVICES

ELECTRICAL TESTING LABORATORIES

Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.

80th St. and East End Ave., New York

MAYDWELL

Glass Insulators

All Standard Numbers For All Purposes

Made of high quality materials in a modern Pacific Coast plant producing an unusually tough glass to withstand all severe service conditions.

MAYDWELL & HARTZELL
INCORPORATED

Electrical Engineers and Manufacturers' Representatives

Los Angeles ★ San Francisco

About the Trade

CHANGE IN OWNERSHIP of the Helper Furniture store and in the management of the Eastern Utah Electric company of Price, Utah, was announced recently. E. Bernardi, former manager of the Eastern Utah Electric Co. purchased the interest of Quilico brothers in the Helper Furniture store and became its manager. Elmer C. Young was named manager of the Eastern Utah Electric Co. store as successor to Mr. Bernardi.

●

ELECTRIC APPLIANCE dealers and manufacturers set a new record for themselves at the Canada Pacific Exhibition in Vancouver, B. C. last month when more of them were represented than ever before.

●

CORRECTION—Announcement in September ELECTRICAL WEST that Marine Electric Co., San Francisco, had established a Portland branch in charge of Frederick J. Harper was in error. No such branch was opened.

●

SUNSET APPLIANCE CO. is a new electrical appliance store opened at 1570 Sunset Blvd., Los Angeles, by Sam Braverman of Braverman Radio & Electric Co. The store is under the management of George Daugherty.

●

EXTENSIVE ADVERTISING program is being staged this fall by the Silex Co., Hartford, Conn. Dubbed the Silex Roundup, the program features advertisements in fourteen national magazines and in 161 large newspapers. Additional feature is a large two-color display for use in dealers' windows.

●

PAYETTE DIVISION of the Idaho Power Co. opened offices last month in the newly constructed Frost Bldg. at Nyssa.

●

SLACK PLUMBING & ELECTRIC CO. Evanston, Wyoming, has added a new show room to display the large stock of Hotpoint ranges, refrigerators, dishwashers and small appliances, Easy Washers and Ironers, Kelvinator ranges and refrigerators, and Monarch ranges, which it carries.

●

CLARK BAKER, Pacific Coast Electrical Bureau, and lighting specialists of the Pacific Gas and Electric Co., gave a program on "Exposition Visitors, Store Fronts, and Window Merchandising" before the San Francisco Electrical Contractors' Assn., Sept. 2.

●

HEADQUARTERS of the Vancouver (B.C.) Electrical Assn. have been moved from Howe St. to 535 Homer St., in the Victory Hall Building.

LINCOLN DEMAND METERS

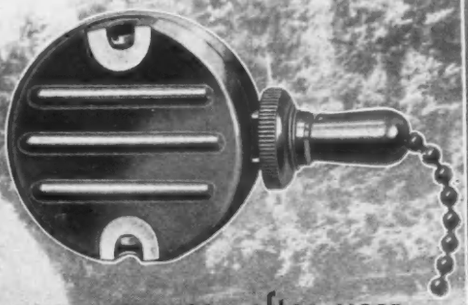
Eliminates LOSS OF DEMAND READING

TYPE WD

Absence of all rapidly moving parts, contacts, and timing mechanisms results in a meter of exceptional dependability and eliminates loss of demand readings.

SEND FOR YOUR COPY OF CATALOG TO

LINCOLN METER COMPANY
SPRINGFIELD, ILLINOIS



McGILL Levolier

SWITCHES carry on year after year, faithful as the falls, seemingly forever. This is because they are made that way—simple, rugged, durable. Made in complete range . . . 3 to 10 Amp., also special switches. Stocked by recognized wholesalers everywhere.

McGILL MANUFACTURING COMPANY
Electrical Specialties of Quality
VALPARAISO, IND.
Box 604

Underground Transmission

Note the air and moisture proof flexible coverings. Sealtite represents a distinct advance in parkway cable construction. It is more pliable than any other underground cable . . . and costs are considerably lower.

Without Conduit

Write for booklet offering suggested uses and explaining long life.

SEALTITE

Parkway and Airport Cable with Maximum Flexibility by

PROVIDENCE

MAYDWELL & HARTZELL
INCORPORATED
ELECTRICAL ENGINEERS
and
MANUFACTURERS' REPRESENTATIVES
Los Angeles ★ San Francisco

CHROMALOX

***Super-Speed* RANGE UNITS**

Fine Ranges Use Them . . Range Buyers Approve Them

Specify these popular units on the ranges you sell. Prospects invariably react favorably to the many strong features of these flat-top, fast cooking burners. Show how easy they are to keep clean—how they give largest area contact —how "two-burners-in-one" saves power. Use them for replacements, too—they fit all ranges.

Represented by
MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash.
1501 N. W. Kearny St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
912 E. Third St., Los Angeles, Calif.
THE PETERSON COMPANY
1921 Blake St., Denver, Colo.

EDWIN L. WIEGAND CO.
7540 Thomas Blvd. Pittsburgh, Pa.

TAYLOR ELECTRIC SERVICE, North 5204 Market St., Spokane, has enlarged and modernized its quarters. A complete line of Norge equipment is being handled by this company.

●

AUERBACH'S new theatre in Salt Lake City is having its electrical system installed by the Capital Electric Co. of Salt Lake City. Extensive electrical equipment and lighting effect are included in this new community theatre.

●

LOCKE & URQUHART, Vernon, B. C., has been taken over by the Interior Electric Co., a newly organized firm.

●

AMONG FEATURES of the new $300,000 Montgomery Ward store in Salt Lake City is a complete electrical department displaying ranges, refrigerators, radios and a full line of small appliances.

●

DELUXE FURNITURE AND APPLIANCE STORE of Bingham, Utah, was opened recently by L. G. Miller, D. A. Bigler and R. A. Broomhead. The three operated stores in Eureka and Midvale, Utah, prior to opening in Bingham.

●

BUZZELL ELECTRIC WORKS of San Francisco recently finished the installation of new power equipment at the radio station transmitter for KSFO, near Islais Creek, San Francisco. A feature of the installation was a Fairbanks-Morse gasoline engine driven generator standby unit arranged to take over the load in approximately 15 sec. from the time of any power failure.

●

ALL ELECTRIC COMPANY, Salt Lake City, recently moved into new quarters on State Street. The new store is known as the Westinghouse store, and was opened with fitting ceremonies Saturday, Sept. 11.

●

BENNETT AND TAYLOR, electrical contractors, Los Angeles, were recently awarded a contract for construction of a municipal power plant in Seward, Alaska.

●

ANOTHER SHOSS electric store has been opened at Layton, Utah, making the fourth of a chain which began at Ogden and includes Brigham and Tremonton.

●

H. C. BRIGGS opened a new Gamble store in St. Anthony, Utah. He was formerly with a Gamble store at Meche, N. Dakota.

●

SUNSET ELECTRIC COMPANY, Seattle, plans expenditure of $60,000 in remodeling its present quarters at Westlake and Thomas Sts.

H. R. ZENKER, sales manager, Western Division of the Progress Corp., distributors for Packard Lectro Shaver, recently announced that Westinghouse Supply Co. had been appointed exclusive electrical wholesaler jobbers for the Packard Shaver. A few previously established outlets will remain unchanged.

●

VANCOUVER NEON, LTD., has been incorporated at Victoria, B. C., as dealers in signal devices. Offices are at 503-06 Rogers Bldg., 470 Granville St., Vancouver.

FOR
- *Lasting Economy*
- *Strength*
- *Safety*

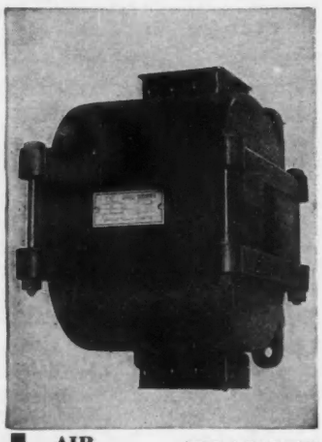
USE

LOCUST PINS
Oak Brackets and Pole Steps

LOCUST PIN CO. FRONT ROYAL, VA.

Maydwell & Hartzell, Inc.
Los Angeles ★ San Francisco

YOU SAVE



With JEFFRIES

AIR COOLED **TRANSFORMERS**

● With a Jeffries Air Cooled Transformer money can be saved. The Air Cooled construction lengthens the life of the transformer and lowers repair costs. Plant expansion and extension can be made economically for a Jeffries Transformer provides the voltage change at the point desired without the need of long and expensive conduit runs. Besides a complete line of standard transformers, special designs and voltage furnished to order. Type S. S. Transformer 1 to 5 K. V. A. illustrated.

JEFFRIES TRANSFORMER COMPANY
5706 LONG BEACH AVE., LOS ANGELES

Trade Literature

1001:

GROUP-OPERATED AIR SWITCHES, tilting insulator type, illustrations, diagrams, dimensions and ratings. Pacific Electric Mfg. Corp.

1002:

ANCHORS AND POWER LINE ACCESSORIES, colored illustrations of equipment, together with function and installation procedure, specifications. James R. Kearney Corp.

1003:

PIN-IT-UP LAMPS, description and color illustrations of the line, consisting of lamps convertible to wall or flat surface mountings. Railley Corp.

1004:

IDEAL MOTOR and maintenance equipment is described in a booklet which includes considerable information on modern trends in motor maintenance. Handy electrical tables are included in the publication by Ideal Commutator Dresser Co.

1005:

BENT-TUBE BOILERS, shows cross-sections of typical installations, methods of construction. Combustion Engineering Co.

Free to you . . . Any of these instructive bulletins . . . Address a post card to ELECTRICAL WEST 883 Mission St., San Francisco, Calif. . . . drop it in the next mail.

1006:

SUPER SERVICE portable cables are specified in a variety of applications in General Cable Corp. Bulletin SS2.

1007:

FEEDER-VOLTAGE BOOSTER-REGULATORS, four step, extensive discussion of principle, construction, operation; illustrations and specifications. Westinghouse Electric & Mfg. Co.

1008:

TROL-E-DUCT, gives full treatment, with numerous illustrations of this wiring equipment, designed to permit quick installation of a flexible, mobile distribution system. Bull Dog Electric Products Co.

1009:

STEAM CONDENSERS, steel shell surface type, brief descriptions with illustrations. Allis-Chalmers Mfg. Co.

1010:

"K" MONEL,, engineering properties of the metal including magnetic characteristics, applications. The International Nickel Co., Inc.

1011:

In introducing a line of fittings for thin-walled conduit, Kwikon Co., 626 West Jackson Blvd., Chicago, emphasizes that a screw driver is the only instrument needed for installation. The line is approved and listed by Underwriters' Laboratories, Inc.

1012:

METAL-ENCLOSED BUS, 62 pages, with several full-page illustrations, dealing with a new eastern installation, together with characteristics, specifications and tests on available equipment. Railway and Industrial Engineering Co.

HEMINGRAY Glass INSULATORS

for primary and secondary insulation service and rural line needs.

Brass-bushed for great strength, perfect threads and full protection against pin expansion.

Hemingray provides many advantages: greater mechanical strength . . . sustained dielectric strength . . . unaffected by sudden temperature changes . . . withstands maximum insulator pin expansion . . . never ages or deteriorates . . . all surfaces impervious to moisture . . . tougher—withstands rough handling . . . clear and flawless for easy inspection.

Available in all styles . . . clear or brown glass . . . ratings up to 15,000 volts. Write for samples.
Owens-Illinois Glass Company . . . Muncie, Indiana.

STEEL STRAND ◆ WIRE

Crapo GALVANIZED PRODUCTS

STEEL STRAND MADE TO RIGID SPECIFICATIONS

Crapo Galvanized Steel Strand is a highly specialized product scientifically manufactured under direct laboratory supervision. Each grade and size is produced from start to finish to meet the exacting demands of the service for which it is intended. Each wire used in forming a particular size and grade is made from the same special steel, processed in the same way, and galvanized by the *Crapo* Process.

For further information consult the nearest distributor of *Crapo* Galvanized Products, or write direct

INDIANA STEEL & WIRE CO.
Muncie, - - Indiana

New Products

Vacuum Cleaners

Moleskin bags, said to prevent dust leakage and consequent germ dissipation, are a feature of the 1938 line of vacuum cleaners introduced in modernistic design by Westinghouse Electric & Mfg. Co. The DeLuxe model includes an efficiency indicator which tells the operator when the bag needs emptying or the nozzle adjusting. It includes headlight, automatic device to hold handle at desired angle, self opening bag, rubber bumper, over-size soft rubber wheels, nozzle covering a wide range of rug thicknesses.

●

Loud Speaker Phone System

A loud speaker phone system comprising one master station and up to four remote stations has been announced by General Electric Co., Radio Division. Called "Handy-Phone," the system permits two-way conversation with any one remote station, or from master station to all remote stations at once. Power connections are made to the master station only, at 115 to 125 volts, 25, 50 or 60 cycles. Stations may be located 2,000 ft. from the master unit, and speech is said to be intelligible up to 50 ft. from the remote station.

●

Low Ceiling Luminaire

A modern luminaire allowing the use of either the new silvered bowl lamp or the standard Mazda lamp is introduced by Smoot-Holman under the name of Aurora. The model gives wide light distribution and is especially adaptable to low ceilings. An aluminum hemisphere inserted in the bottom of the ivory-finished enamel reflector permits a small amount of light to trickle out around the edges.

Room Conditioner

Return and delivery of air through slotted moldings instead of grilles and operation either with or without water connection are features of the self-contained room conditioner announced by General Electric Co. It is rated 8,000 B.t.u. per hr. when air-cooled, capacity being increased to about 11,000 B.t.u. when a ¼-in. water line is connected for cooling the condenser by evaporation. It is designed for mounting at a window with a window duct 18 in. long, adjustable to shorter length. Weighing 500 lb., it is 41x19 in. by 44½ in. high. Cabinet is finished in burled walnut. Sub-assemblies consist of a 1-hp. motor driving compressor, motor cooling fan, and water pump; a 1/6-hp. motor directly connected to a room air fan; finned copper tube evaporator, expansion valve, and room air filter; finned copper tube condenser, liquid sub-cooler, liquid receiver and water nozzles.

●

Galvanized Iron Clamp

As an aid to angle construction on distribution and farm lines, the Ohio Brass Co. has introduced a clamp which permits angles from 30 to 120 deg. to be turned without necessity of dead-ending and using jumpers. The malleable iron, hot-dipped galvanized clamp is constructed so that no parts need be removed for attaching the conductor. With the conductor laid in the clamp seat, it is gripped by tightening a nut. This also makes it possible to remove clamps from insulator with hot line tools. It is designed for conductor tension in excess of 5,000 lb. under full ice, wind and temperature loadings.

Conduit Connector

The "Bondhub" is a new type conduit-box connector by which rigid conduit may be connected with a box as firmly and as permanently as if the connection were welded. It consists of three parts: A hub with one end threaded to fit on the conduit, a telescoping flange sleeve and a "Wedgscru." The threaded end of the hub is screwed onto the conduit and the sleeve is slipped through the knock-out hole of the box into the hub. The Wedgscru is then driven through the hub into a counter sunk hole in the sleeve. The farther the Wedgscru is driven, the tighter the flange draws the hub against the box.

The ease of installation is perhaps the most important feature of this connection. Neither the box nor the conduit need be turned. Tightening the Wedgscru with a screwdriver is the only operation necessary to assure a permanent, tight connection. National Electric Products Corp., Pittsburgh, Pa.

●

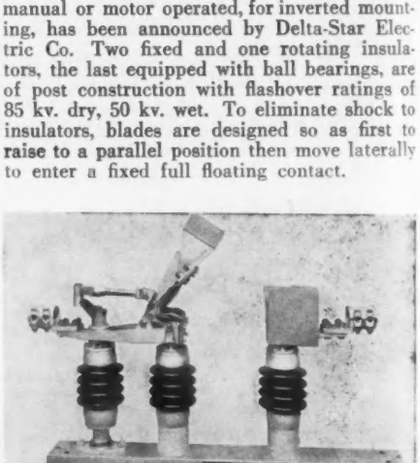
Kettle-Equipped Range

Necessity for frying pans, double boilers, and all the other varied pots and pans a housewife uses is obviated by the new electric range introduced by Electromaster, Inc. Four cooking kettles, called Vita-Misers, are built into the top of the stove. They are of sizes and depths to serve all purposes. Other features include lighted oven, swinging table lamp, built-in electric time clock, and seamless one-piece table top and back plate. The range is listed as Model 100.

●

Heavy-Duty Switch

A new heavy-duty switch, consisting of three single-pole, 15-kv., 1,200-amp. units, manual or motor operated, for inverted mounting, has been announced by Delta-Star Electric Co. Two fixed and one rotating insulators, the last equipped with ball bearings, are of post construction with flashover ratings of 85 kv. dry, 50 kv. wet. To eliminate shock to insulators, blades are designed so as first to raise to a parallel position then move laterally to enter a fixed full floating contact.



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General Elec. Co.
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Norge Division, Borg-Warner Corp.

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A. B. Chance Co.
Everstick Anchor Co.
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James R. Kearney Corp.
W. N. Matthews Corp.

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General Elec. Co.
General Elec. Supply Corp.
Graybar Elec. Co., Inc.
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Leonard Division
Lindemann & Hoverson Co., A. J.
Malleable Iron Range Co.
National Enameling & Stamping Co.
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Norge Division
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The Silex Co.
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Thermador Elec'l Mfg. Co.
Weniz Elec. Heater Co.
Westinghouse Elec. Supply Co.
The Woolwine-Norris Corp.

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Locust Pin Co.

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General Elec. Co.
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Indiana Steel & Wire Co.
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Pacific Coast Elec'l Bureau
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Graybar Elec. Co., Inc.
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WHERE TO BUY IT IN THE WEST

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Electrical West, published monthly at San Francisco, Calif., October 1, 1937.

State of California, } ss.
County of San Francisco }

Before me, a notary in and for the state and county aforesaid, personally appeared George C. Tenney, who having been duly sworn according to law, deposes and says that he is the Editor of Electrical West, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:

Publisher, McGraw-Hill Company of California.....833 Mission St., San Francisco, Calif.
Editor, George C. Tenney.....883 Mission St., San Francisco, Calif.
Managing Editor .....None
Business Manager .....None
Manager.....Roy N. Phelan, 883 Mission St., San Francisco, Calif.

2. That the owners are: Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.

McGraw-Hill Company of California, San Francisco, Calif.; McGraw-Hill Publishing Company, Inc., New York City; J. H. McGraw, New York City; R. A. Balzari, San Francisco, Calif.; N. A. Bowers, San Francisco, Calif.; George C. Tenney, San Francisco, Calif.; John W. Otterson, San Francisco, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amounts of bonds, mortgages, or other securities are: None.

GEORGE C. TENNEY, Editor.

Sworn to and subscribed before me this 21st day of September, 1937.

(SEAL) W. E. SCHORD,
(My commission expires March 22, 1938)

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Roller-Smith Co.
Square D Co.

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Switches, High Tension
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Square D Co.
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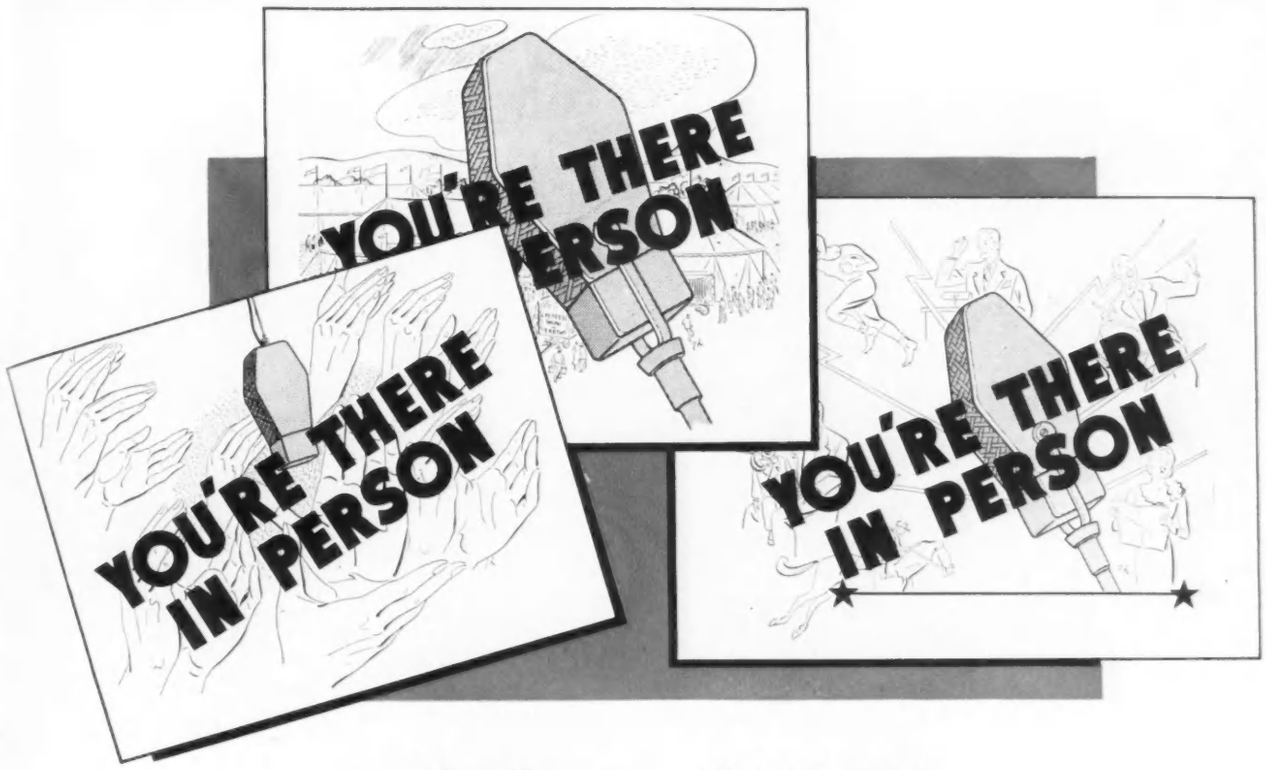

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WITH this theme-song, the radio industry in Northern California is about to launch its 1938 cooperative sales promotion. For three weeks beginning October 11, dealers and manufacturers, broadcasters and P. G. and E. will be engaged in a concerted effort to sell radios—and better radios—with more profit margin for the dealer and more performance and satisfaction for the customer. Complete information will soon be forthcoming from the publicity offices of the Electric Appliance Society. Watch for the bulletin describing the campaign plan, the free newspaper and radio advertising and the home demonstration offer. Read it and then use it for planning a tie-in program of your own. Remember, only three weeks, Oct. 11-30.

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